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THE UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

A THEORETICAL AND EMPIRICAL INVESTIGATION OF HUMAN RESOURCE ACCOUNTING

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

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MOHAMMAD ALI SANGELADJI

Norman, Oklahoma

1975

A THEORETICAL AND EMPIRICAL INVESTIGATION

OF HUMAN RESOURCE ACCOUNTING

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DISSERTATION COMMITTEE

To My

Wife, Mother, and Two Aunts

and

the memory of my father: Mohammad M. Sangeladji

1975

Mohammad A. Sangeladji

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ABSTRACT

During the past decade, human resource accounting has attracted the increasing attention of many accountants and managers. This interest resulted in the development of several measurement models, as well as some controversy regarding their usefulness. The values and the shortcomings of the models in providing useful information for making investment decisions, however, have not yet been adequately investigated.

This study was devoted to (a) the analysis of seven measurement models and the use of their underlying principles in developing another model with fewer shortcomings and (b) the empirical investigation of the following issues:

1. Is human resource information provided on the basis of either the acquisition cost model or the proposed model useful for making investment decisions?

2. Which of these two measurement models and the three possible methods of reporting human resources (in the body of the conventional financial statements, in footnotes to the conventional financial statements, or in a supplementary statement) are preferred by the users of financial statements?

3. Will the responses to these questions differ significantly on the basis of the profession, the education, the background, and the degree of the respondents' reliance on the conventional financial statements?

Information for developing the model was gathered through library research. Empirical research data were secured through a mail survey of 100 CPAs, 100 CFAs, 100 trust officers, 121 controllers and managers, and 31 students. The following findings were based on the opinions of 209 participants:

1. Monetary human resource information provided by either the acquisition cost model or the proposed model was viewed as being a little useful in making investment decisions.

2. The difference between the usefulness of these models was not statistically significant. However, the proposed model was preferred mainly because of such attributes as completeness and comprehensiveness. The acquisition cost model was preferred for its simplicity and clarity. These models were not preferred by some of the participants because of (a) the alleged impossibility to "dollarize" human resources, (b) the inability of some financial statement users to comprehend and use human resource information, and (c) the subjectivity of the information.

3. For reporting human resources, a supplementary statement was preferred most, information in footnotes and in the body of the conventional financial statements were the second and the third preference.

4. The degree of usefulness of information provided by the two models differed among the professional groups; trust officers and students expressed the most favorable views; CPAs and CFAs, the less favorable views; and the controllers, the least favorable views.

5. No significant relationship was found between participants' level of education and the usefulness of information provided by either model. However, those who had completed their education recently viewed the information as being more useful than others.

6. The degree of the usefulness of the aforementioned information was the same among all participants, regardless of their degree of familiarity with human resource accounting and their degree of reliance on the financial statements in making investment decisions.

A THEORETICAL AND EMPIRICAL INVESTIGATION OF HUMAN RESOURCE ACCOUNTING

CHAPTER I

INTRODUCTION

The concept of viewing human beings and their skills as valuable resources and capital is not new among economists and can be traced in the writings of such well-known economists as Sir William Petty, Adam Smith, Jean Baptiste Say, John Stuart Mill, William Roscher, and Irving Fisher.[1] Like most economists, accountants also have long recognized the importance of the human factor in the productivity and the prosperity of nations and business organizations.

However, except for some limited efforts during recent years, the accounting profession has made no serious attempt to devise a monetary method for measuring and reporting a firm's human resources. Accountants often have tried to incorporate into a goodwill account the human resources of a firm. This practice has been criticized unfavorably for several reasons, mainly because a goodwill account is usually a trash-hold account that accommodates many nebulous items, including human resources.[2]

The increasing number of companies during this century with highly educated executives and technically trained

employees has attracted the attention of many managers and accountants to the vital importance of human resources. During the past ten years, many articles by accountants and non-accountants have dealt with the usefulness of human resource information in managerial and investment decisions. Some effort has also been directed toward the development of human resource accounting.

In 1966 a group of researchers at the University of Michigan, headed by Professors Rensis Likert and R. Lee Brummet, launched a program to develop and implement a system of human resource accounting in industry. Subsequently, a system of human resource accounting was introduced by these researchers into the financial accounting of the R. G. Barry Corporation, a manufacturing firm of 1700 employees.[3] Because of the apparent success of the system at R. G. Barry, other companies including AT&T, Touche Ross & Company (Canada), Celanese Corporation, Texas Instruments, Graver Water Conditioning, Flying Tiger Line, and Nomura Securities Company (Japan) have also introduced human resource accounting into their information systems.[4]

Statement of the Problem

As will be discussed later, human resource accounting has been claimed to have several useful applications to the external users of accounting data. These theoretical applications of human resource accounting, however, have been envisioned mainly by educators on the basis of their

deductive reasoning. No adequate empirical investigation, in fact, has been completed to ascertain the actual usefulness of human resource accounting.[5]

This study, therefore, was undertaken in an attempt to answer the following specific research questions concerning (a) the actual usefulness of human resource accounting to the potential investors and (b) the determination of a proper method of reporting:

1. Is human resource information, provided on the basis of the acquisition cost model, useful for making investment decisions by the potential investors?
2. Is human resource information, provided on the basis of the discount value method (suggested in this study) useful for making investment decisions by the potential investors?
3. Which of the above methods of measuring human resources is preferred by the potential investors?
4. Which of the three possible methods of reporting human resources is preferred by the potential investors?
5. Will the responses to the first two questions be significantly different, depending on the profession, educational background, and the level of reliance of the respondents on the conventional financial statements?

Definition of Terms

Among the several available definitions of human resources and human resource accounting the following are

deemed pertinent for the purpose of this study.

Human Resources

Ivar Berg has defined human resources in a broad sense as follows:

> Human resources are the energies, skill, and knowledge of people which are, or which potentially can or should be, applied to the production of goods or the rendering of services. Thus, the term connotes man in relationship to the world of work, and such work involves producing things and providing services of all kinds in the social, political, cultural, and economic development of nation.[6]

Rensis Likert's definition of human resources is rather specific and pertinent to business organizations. According to Likert, human resources "refer both to the value of the productive capacity of a firm's human organization and to the value of its customer goodwill."[7]

Nabil Elias has defined human resources as the "aggregates of service potentials available for or beneficial to expected operations of the firm from its internal or external members, that is, managers, employees, and customers."[8]

Both Likert and Elias have included customer goodwill as a part of a firm's human resources. For the purpose of this study, customer goodwill is excluded from the definition so that human resources of a firm are viewed of such attributes of employees as knowledge, training, skill, experience, and good health that contribute to the present, as well as the future success of the firm.

Human Resource Accounting

Human resource accounting was defined by Brummet, Pyle, and Flamholtz as "the process of identifying, measuring, and communicating information about human resources to facilitate effective measurement within an organization."[9] That definition was later expanded by Brummet as follows:

> Human resource accounting is the process of developing financial assessments for people within organization and society and the monitoring of these assessments through time. It deals with investments in people and with economic results of these investments. It is a means by which managers are encouraged to give more serious consideration to human resource impacts to all of their decisions. It provides a necessary supplement to conventional income measurement and thus broaden the coverage of measures of financial well-being and financial success of organizations.[10]

Usefulness of Human Resource Accounting

Usefulness of human resource accounting was first classified by Nabil Elias into these two categories defined as follows: (a) Assumed usefulness that refers to the usefulness of human resource accounting from some theorists' point of view that is based on a deductive reasoning and (b) actual usefulness that refers to the level of information provided by human resource accounting that can actually be used in decision making.[11]

Measurement Criteria

The following criteria are deemed essential for determining whether a measurement model can be useful for decision making:

Comprehensiveness

The extent to which a measurement model includes the pertinent and measurable variables in its operational framework reflects the comprehensiveness of the model. There are several variables pertinent to the measurement of costs and value of a firm's human resources. However, the most important ones are the employee's future service life, present and future level of health, age, knowledge, experience, and willingness to cooperate.[12]

Applicability

This criterion relates to the level of applicability of a measurement model. A model is operational and applicable only if the required data are readily and economically available.[13]

Relevancy

Although a model may meet the preceding two criteria, its usefulness will be limited if the information generated is of no consequence to the decision makers. The usefulness of a measurement model, therefore, is dependent upon how much it improves the consequences of business and investment decisions.[14]

Comparability

Closely allied to the relevancy criterion is that of comparability. A good measurement model should provide sound basis for comparison. A model that cannot furnish relevant

and sufficient information for enhancing comparability is not useful for decision making.

Reliability

The reliability of a measurement model can be expressed in terms of its openness for inclusion of personal bias in the measurement process and the dispersion of the results produced. The reliability and the objectivity of a model are improved, when inclusion of personal bias in the measurement process is red[illegible]. However, a measurement model free from personal [illegible]ifferent results when applied by diff[illegible]articular situation. In that case, [illegible]jectivity of the model depend "[illegible]lts around a mean or average figu[illegible]ment model that offers less dispe[illegible]eliable than others. This criterion is of [illegible]nce for measuring and reporting human resources to the external users of financial statements.[16]

Assumed Usefulness of Human Resource Accounting to the External Users of Financial Statements

Generally speaking, the main functions of financial statements to their external users, especially investors and creditors are (a) to furnish adequate and reliable information for evaluating performance of business organizations and (b) to improve the basis for comparing the performance and the financial positions of two or more companies. The

and sufficient information for enhancing comparability is not useful for decision making.

Reliability

The reliability of a measurement model can be expressed in terms of its openness for inclusion of personal bias in the measurement process and the dispersion of the results produced. The reliability and the objectivity of a model are improved, when inclusion of personal bias in the measurement process is reduced. However, a measurement model free from personal bias may produce different results when applied by different individuals in a particular situation. In that case, the reliability and the objectivity of the model depend "upon dispersion of the results around a mean or average figure."[15] Thus, the measurement model that offers less dispersed results is more reliable than others. This criterion is of utmost importance for measuring and reporting human resources to the external users of financial statements.[16]

Assumed Usefulness of Human Resource Accounting to the External Users of Financial Statements

Generally speaking, the main functions of financial statements to their external users, especially investors and creditors are (a) to furnish adequate and reliable information for evaluating performance of business organizations and (b) to improve the basis for comparing the performance and the financial positions of two or more companies. The

conventional financial statements apparently fall short of meeting these functions properly. One reason for this deficiency of the conventional financial statements is the method of treating expenditures for human resources. As Brummet stated:

> A primary difficulty of present financial statements involves the distortion of "net income." The figure designated as "net income" is distorted because all expenditures made to acquire human assets are expensed immediately rather than being amortized over their expected service life.[17]

Closely allied to the preceding difficulty is the problem of measuring and reporting total resources (assets) of business organizations. Because of the practice of expensing all expenditures relating to human resources, the conventional balance sheets fail to reflect in the firms' assets the costs of human resources. This exclusion reduces the comparability feature of financial statements and distorts the rate of return measurement.[18]

In view of these difficulties, therefore, Professor Hermanson has contended that the treatment of human resources as assets in the financial statements can result in "an increased comparability and completeness of financial statements leading to a more efficient allocation of funds in the economy, a rejuvenation of the position statements, a closer tie-in between financial statements, and an aid to the analysis of firms for internal purposes."[19]

The practice of treating human resources expenditures as investments rather than as current expenses and reporting

them in financial statements, furthermore, could prevent management from liquidating human resources or overlooking profitable investments in human resources in periods of profit squeeze.[20] As Professor Likert stated, "so long as no quantitative surveillance is maintained over a firm's human assets, its management can readily derive a substantial portion of its earnings in any year or even in several consecutive years from liquidating these human assets."[21]

Based on these observations, therefore, Flamholtz has concluded that "investors have an interest in changing the conventional accounting treatment of human investments because it may cause managerial behavior harmful to the long-term success of an organization, as well as to investors' equity."[22]

In short, the foregoing observations suggest the following useful outcomes from the application of accounting for human resources:

Completeness and Comparison

The inclusion of information about a firm's human resources in financial statements means that statements will depict all resources of a firm rather than only those of a tangible nature. This completeness, thus, will enable potential investors to compare tangible resources, as well as human resources of firms, for their investment purposes. Likewise, such a comparison will assist creditors in granting loans whenever more than one borrower is seeking their limited funds.

Analysis and Prediction

The inclusion of information about a firm's human resources in financial statements will also permit the users of the statements to calculate and analyze rate of returns on the tangible assets, the human resources, and the total resources of the firm. These measures and ratios could provide a trend as to how effectively and efficiently the total available resources, tangible as well as human, are being utilized. Such a trend would be an invaluable tool for predicting a firm's success.

Prevention and Motivation

The practice of capitalizing and reporting investments in human resources could also prevent management from taking harmful personnel decisions, such as liquidating human resources to improve temporarily the results of the operations with subsequent long-term losses. On the contrary, that practice could motivate management to undertake profitable investments in human resources, even in the periods of profit squeeze.

Need for the Study

The inadequacy of empirical research in the area of human resource accounting has been recognized also by the members of the American Accounting Association's 1972-73 Committee on Human Resource Accounting.[23] According to

Flamholtz, one of the Committee members, the following five basic classes of issues have not yet been resolved fully in human resource accounting:

1. the question of its utility to management and/or investors,
2. the development of measurement methods,
3. the development of operational systems in organizations,
4. the organizational impact of human resource accounting, and
5. the appropriateness and methods of reporting human asset to external users of corporate financial accounting information.[24]

With regard to the usefulness of human resource accounting to the potential investors, Elias conducted an empirical study in 1970 to "assess whether decisions based on financial statements incorporating human assets would be different from those based on conventional statements. Naturally, if decisions were quite different, it could be inferred that the added data were highly utilized (or the degree of what has been referred to as actual usefulness is relatively high)."[25]

With that purpose in mind, Elias sent to groups of 64 Chartered Financial Analysts, 100 financial analysts, 100 Certified Public Accountants in the Minneapolis-St. Paul area and a group of 102 accounting and finance students at the University of Minnesota questionnaires accompanied by either (a) a set of conventional financial statements, (b) a set of human asset statements, or (c) a set of combined

conventional and human asset statements for two hypothetical firms.[26] That study indicated that "although the differences among the decision outputs were statistically significant (overall alpha = .02), the degree of association measured by the contingency coefficient C was only .288."[27]

The above study was conducted on a regional basis. In addition, the sample used in this study included only CPAs, CFAs, financial analysts, and students. In fact, there are other important groups of potential investors who utilize financial information in their decision making. According to The Wall Street Journal,

> Bank trust departments like Continental's have become by far the largest professional money managers in the U.S. . . The very size of their holdings has made bank trust departments the subject of increasing attention of late, much of it critical. Some observers decry the potential economic power the trusts possess because of the large interest they control in many major corporations.[28]

Furthermore, the above research was limited to a study of the impact of human resource information on the investment decisions, when such an information was provided on the basis of the acquisition cost model (historical cost). The research, however, did not reveal the possible impact and usefulness of human resource information when other models of measurement are applied. For this reason, Elias suggested that "it would be interesting to find out if decision outcomes would, in fact, as it is normally assumed, be affected by different system of measurement."[29]

Thus far over half a dozen models have been developed

for measuring a firm's human resources. Included are the acquisition cost model, the discount value of employees' future earnings, the adjusted present value of future salaries, and the behavioral models.

Of these models, only the acquisition cost model has been viewed practical and has been used by R. G. Barry Corporation for internal and external reporting. The other models, although are being used on a limited basis for internal reporting, have not yet been used for external reporting because of several alleged shortcomings. For instance, the following shortcomings are associated with models that utilize the present value of employees' future salaries:

1. the unavailability of the required input data,
2. the complexity of the models, and
3. the difficulty of determining an unbiased and objective rate of discount.

Despite the alleged shortcomings, the concept of measuring human resources through present value of salaries appears sound theoretically. According to Professor Marvyn W. Wingfield:

> Most accountants would probably agree that, in theory at least, the best measure of human resources is the present value of the future benefits to be derived from these human skills. . . . [One] method of measuring human value is to capitalize the wages and salaries, adjusted for relative efficiency in productivity, resulting from human resource expenditures.[30]

That author, likewise, has envisioned the determination of the discount rate as a pragmatic difficulty.[31] This study, therefore, was designed to propose a measurement model

free from some of the foregoing shortcomings, in addition to investigating nationwide the usefulness of human resource accounting and determining a proper method of reporting.

In short, this research was an effort toward investigating empirically three of the five unresolved issues in human resource accounting suggested by the members of the AAA Committee on Human Resource Accounting and a response to recommendations of Wingfield and Elias concerning the utilization of the present value of salaries.

Research Methodology

In an effort to design and propose a measurement model, seven of the suggested models were studied through library research. For the purpose of investigating the usefulness of the proposed model and the acquisition cost model in measuring and reporting a firm's human resources, the mail-survey technique was adopted to solicit the opinions of 100 Certified Public Accountants, 100 Chartered Financial Analysts, 100 trust and financial officers of banks and trust companies, 121 controllers and managers of large corporations, and 31 students concerning the previously mentioned research questions (page 3). The questionnaire contained fifteen questions and three sets of condensed financial statements, prepared on the basis of the following principles and assumptions:

> Financial Statements Set 1: This set of financial statements was prepared on the basis of conventional accounting principles. Therefore, all the cash outlays related to recruiting, training, and developing employees were viewed as current expense and were treated accordingly.

Financial Statements Set 2: This set of financial statements was prepared on the assumption that some of the currently incurred costs of recruiting, training, and developing employees could assist future operating periods. Thus, such outlay costs were first capitalized, then gradually amortized according to the "matching principle." In short, costs of recruiting, training, and developing employees appear on set 2 as a monetary measure of the company's human resources.

Financial Statements Set 3: This set of financial statements was prepared on the assumption that employees' compensation is a reliable and readily available index, representing a major part of the value and costs of a firm's human resources. In other words, the higher the contribution of employees to the firm, the higher would be their compensation. Based on this assumption, set 3 included the discount value of adjusted 5-year salaries, wages, and fringe benefits of all employees, in addition to the capitalized costs of recruiting, training, and developing employees, as a monetary measure of the firm human resources. The discount rate and the adjustment factors used in set 3 were determined according to the measurement model suggested in this study.

After the empirical data had been gathered, a set of following hypotheses prepared on the basis of the research questions were tested by employing pertinent statistical tools and techniques.

Hypotheses

The following three major hypotheses and two series of sub-hypotheses were developed for the research questions listed on page 3.

Major Hypothesis A:

Information provided in Set 2 regarding a firm's human resources is useful to the users of financial statements for making investment decisions.

Sub-Hypotheses A:

A_1. The degree of usefulness of information provided in Set 2 is the same to all users of financial statements, regardless of the profession of the users.

A_2. The degree of usefulness of information provided in Set 2 is the same to all users of financial statements, regardless of the level of the education of the users.

A_3. The degree of usefulness of information provided in Set 2 is the same to all users of financial statements, regardless of the level of the familiarity of the users with human resource accounting.

A_5. The degree of usefulness of information provided in Set 2 is the same to all users of financial statements, regardless of what portion of the users' job involves consulting or advising investors how to manage their investments.

A_6. The degree of usefulness of information provided in Set 2 is the same to all users of financial statements, regardless of how much the users rely upon and use published financial statements.

Major Hypothesis B:

Information provided in Set 3 regarding a firm's human resources is useful to the users of financial

statements for making investment decisions.

Sub-Hypotheses B:

B_1. The degree of usefulness of information provided in Set 3 is the same to all users of financial statements, regardless of the profession of the users.

B_2. The degree of usefulness of information provided in Set 3 is the same to all users of financial statements, regardless of the level of the education of the users.

B_3. The degree of usefulness of information provided in Set 3 is the same to all users of financial statements, regardless of the recency of the education of the users.

B_4. The degree of usefulness of information provided in Set 3 is the same to all users of financial statements, regardless of level of the familiarity of the users with human resource accounting.

B_5. The degree of usefulness of information provided in Set 3 is the same to all users of financial statements, regardless of what portion of the users' jobs involve consulting or advising investors how to manage their investments.

B_6. The degree of usefulness of information provided in Set 3 is the same to all users of financial statements

regardless of how much the users rely upon and use published financial statements.

Major Hypothesis C:

Human resource statements Set 3 is more useful to the users of financial statements for making investment decisions than human resource statements Set 2.

Limitations of the Study

This study investigated the application and the usefulness of monetary information about a firm's human resources. Because several measurement approaches already have been suggested, this study concentrated only on the usefulness of two measurement models, namely the acquisition cost model and the discount value of employees' compensation.

Furthermore, the study investigated the application and the usefulness of monetary information about a firm's human resources to the external users of financial statements, especially potential investors. Hence, the application and the usefulness of the information to the management and the internal users were considered beyond the scope of this research.

With regard to the external users of financial statements, moreover, this research was restricted to the application and the usefulness of human resource information in making investment decisions. Therefore, no attempt

was made to determine the application and the usefulness of the information in making other decisions, such as those made by creditors, labor unions, and governmental agencies.

For the purpose of ascertaining the opinions of potential investors, this research utilized a group consisting of CPAs, CFAs, trust and financial officers, managers, and students. Obviously, other investors utilize financial statements in their investment decisions. Because of the researcher's limited financial resources, such other investors were not included in this research.

The outcomes of this research represent the opinions of a group of potential investors expressed during 1975.

Organization of the Paper

Chapter I presented a brief background of human resource accounting, the definition of terms, some assumed usefulness of human resource accounting, the research problems, the need for the study, the research methodology, and the limitations of the study. Chapter II is devoted to the presentation and the discussion of seven suggested measurement models. In Chapter III, a refined measurement model is introduced and its application and attributes are discussed. Chapter IV summarizes the research methodology and the statistical tools employed in the data analyses. In Chapter V, the outcomes of the empirical investigation and the statistical analyses are presented. The summary, conclusions, and recommendations, appear in Chapter VI.

FOOTNOTES

[1]B. F. Kiker (ed.), Investment in Human Capital (Columbia, South Carolina: University of South Carolina Press, 1971), p. 51.

[2]Allen A. Cooper and James E. Parker, "Human Resource Accounting: An Examination," Cost and Management, Vol. 47, No. 1 (January-February 1973), p. 22.

[3]R. Lee Brummet, Eric G. Flamholtz, and William C. Pyle (ed.), Human Resource Accounting; development and implementation in industry (Michigan: Braun & Brumfield, Inc., 1969), p. iii.

[4]R. L. Woodruff, Jr., "Measuring Staff Turnover," Canadian Certified Accountant, Vol. 102 (February 1973), p. 38.

[5]Eric Flamholtz, Human Resource Accounting (Encino, California: Dickenson Publishing Co., 1974), p. 329.

[6]Ivar Berg (ed.), Human Resource and Economic Welfare (New York: Columbia University Press, 1972), p. 129.

[7]Rensis Likert, The Human Organization: Its Management and Value (New York: McGraw-Hill Book Company, 1967), p. 148.

[8]Nabil Elias, "The Impact of Accounting for Human Resources on Decision-Making: An Exploratory Study," unpublished dissertation, University of Minnesota, 1970, p. 20.

[9]Brummet, Flamholtz and Pyle, Human Resource Accounting; Development and implementation in industry, p. iii.

[10]Ibid., p. 15.

[11]Elias, "The Impact of Accounting for Human Resources on Decision-Making: An Exploratory Study," p. 3.

[12]Bikki Jaggi and Hon-Shiang Lau, "Toward a Model for Human Resource Valuation," The Accounting Review, Vol. XLIX, No. 2 (April 1974), p. 321.

[13]Ibid., p. 322.

[14]Ibid., p. 322.

[15]Eldon S. Hendriksen, Accounting Theory (Homewood, Illinois: Richard D. Irwin, Inc., 1970), p. 115.

[16]Ibid., p. 116.

[17]Brummet, Flamholtz and Pyle, Human Resource Accounting; Development and implementation in industry, p. 35.

[18]Ibid., p. 35.

[19]Roger Hermanson, "Accounting for Human Assets," Occasional Paper No. 14, Bureau of Business and Economic Research, Graduate School of Business Administration, Michigan State University, East Lansing, 1964, p. 6.

[20]Flamholtz, Human Resource Accounting, p. 20.

[21]Likert, The Human Organization: Its Management and Value, p. 103.

[22]Flamholtz, Human Resource Accounting, p. 21.

[23]"Report of the Committee on Human Resource Accounting," The Accounting Review (Supplement to Vol. XLVII, 1973), pp. 180, 181.

[24]Flamholtz, Human Resource Accounting, p. 329.

[25]Elias, "The Impact of Accounting for Human Resources on Decision-Making; An Exploratory Study," p. 110.

[26]Ibid., p. 52.

[27]Ibid., p. 114.

[28]Jonathan R. Laing, "Fiduciary Giants," The Wall Street Journal (January 7, 1975), p. 1.

[29]Elias, "The Impact of Accounting for Human Resources on Decision-Making; An Exploratory Study," p. 116.

[30]Mervyn W. Wingfield, "Another Look at Human-Resource Accounting," The Virginia Accountant, Vol. 23 (September 1971), p. 11.

[31]Ibid., p. 11.

CHAPTER II

ANALYSIS OF SEVEN MODELS FOR MEASURING HUMAN RESOURCES

Introduction

Generally speaking, a business enterprise operates in two markets. It purchases its required resources in one market (input) and sells its products in another market (output). The price calculated in the input market represents a measure of the consideration paid by the firm in obtaining its assets. Such a price reflects the cost of the asset to the purchasing organization. The price calculated in the output market, on the other hand, represents the funds either received or to be received by the firm in transferring its assets or services to customers. The present value of such a price reflects the economic value of the assets or services to the selling organization.[1] Depending on the operating market, therefore, a business organization can either (a) measure the cost or (b) estimate the value of its tangible resources.

On the basis of the above concept, several measurement models have been suggested for measuring cost and estimating value of tangible resources. These models

include the historical costs, the current replacement costs, the current cash equivalent, the discount value of future costs, and the present value of future cash receipts.[2]

This concept also has been used for developing models that measure cost and estimate value of a firm's human resources. Included are the acquisition cost model, the Flamholtz current replacement cost model, the Lev and Schwartz discount value of employees' future salaries model, the Hermanson adjusted present value of employees' salaries model, and the Frantzreb, Landau, and Lundberg model. In addition, there are two behavioral models; one developed by Rinsis Likert, and the other, by Scott Myers and Vincent Flowers.

Even though these models possess some usefulness, they appear to have some shortcomings. This chapter is devoted to an analysis of each of these models, in turn, and to a discussion of their usefulness and shortcomings on the basis of the measurement criteria defined on pages 5-7 of Chapter I.

The Likert Socio-Psychological Model

Description of the Model

Following the Hawthorne study in 1927, new thoughts entered the field of management. One of these thoughts was the belief that there is a close correlation between the

performance of a business organization and its employees' morale, attitude, and motivation. Since then, many studies have been completed either to prove or to disprove such a correlation.[3]

Rensis Likert, for instance, has conducted several studies on this topic since 1947 and has concluded "that morale and productivity were positively related; that the higher the morale, the higher the productivity."[4] To Likert, morale of employees and the productivity of an organization are functions of several other variables, called "causal variables." These variables include managerial behavior, style, policies, and organizational structure. Likert also identified another set of variables that seem to affect performance of an organization. These variables, which are called "intervening variables" include the loyalties, the attitudes, the motivation, the goals, and the perceptions of all members of the organization.[5]

The interplay of causal and intervening variables, as Likert observed, determines the "end-result variables" consisting of factors such as the organization's profits, costs, sales, cash-flows, and so on. In other words, "a certain pattern of causal variables yields certain levels of intervening variables which, in turn, lead to certain levels of end-result variables."[6] Based on his observations, therefore, Likert has contended that human resources of an organization "can ultimately be measured by predicting a

firm's future earnings based on the current status of causal and intervening variables and then discounting to net present value and allocating a portion of this value to human assets."[7]

Discussion of the Model

The impact of job satisfaction (intervening variables) on job performance (end-result variables) has been widely researched since 1932.[8] The existing literature regarding such a correlation between satisfaction and performance of employees was studied by Brayfield and Crokett in 1955. They concluded "that measures of job satisfaction did not show consistent relationships with productivity measures."[9] This conclusion also has been supported by considerable subsequent research. For instance, Kahn (1960), Rosen and McCallun (1962), and Prien, Barrett, and Svetlik (1967) have arrived at the same general conclusion.[10]

Besides this conclusion, there are some arguments among researchers whether (a) performance is a function of satisfaction or (b) satisfaction is a function of performance. The works of Porter and Lawler (1968) and Bowen and Siegel (1970) support the latter. As Bowen and Siegel stated. their research "provided strong support for viewing satisfaction as dependent on performance and little support for viewing performance as an outcome of satisfaction."[11]

The foregoing observation and conclusion, therefore, introduce some doubt as to the validity of the Likert

socio-psychological model for measuring the end-result variables through the analyses of managerial practices, organizational structure, and intervening variables, which are believed to affect employees' level of satisfaction. This doubt is mainly due to the questionable relationship that exists between employees' satisfaction and production.

In addition to the preceding criticisms, the most questionable aspect of the model is the conversion of the end-result variables (the future productivity and earnings of the firm) to a present value figure through a discounting process. The question arises because of difficulty in determining an objective and reliable rate of discount.

Despite the preceding criticisms, the application of the Likert model (without conversion of the result into dollar value) could provide useful information to both internal and external users of financial data regarding the motivational level and type of managerial practices in an organization. As Professor Hendriksen commented,

> While it cannot be denied that many types of monetary data may be relevant in external reporting, it is also possible that non-monetary data . . . may be found relevant for certain predictions and decision making. Accountants should also search for improved alternative methods of measuring and presenting both monetary and non-monetary data.[12]

In short, the Likert socio-psychological model, if applied properly, could provide relevant and useful non-monetary information about the present and the expected future attitude, behavior, and satisfaction of a firm's

human resources. However, the application of the model for estimating a monetary value of a firm's human resources is somewhat questionable and subjective.

The Scott Myers and Vincent Flowers Model

Description of the Model

This model is conceptually very similar to the Likert model. According to this model, performance of an employee that represents his value to his employing firm is a function of five variables; namely, his knowledge, skill, health, availability, and attitude. These five variables are considered to be highly interrelated with the attitude variable having the greatest impact on the end result of the other four variables.[13]

According to that conceptual framework and "on the assumption that salaries are money invested by the organization to purchase productive skill, the attitude score becomes a meaningful indicator of the extent to which applied skills represent an adequate return on this investment in salaries."[14] In other words, the value of an employee to his firm can be estimated by calculating his attitude score through a rating-sheet technique and multiplying it by his annual salary. The difference between such a value and the employee's annual earnings, consequently, represents the gain or loss of the firm by retaining the employee. The following example illustrates this

measurement model.

TABLE 2-1

DOLLARIZED ATTITUDES

Individual	Annual Salary	Attitude Weight	Attitude Score	Weighted Attitude Score
John Doe	$14,000	5	1.05	5.25
Mary Brown	7,000	5	1.12	5.60
Harry Smith	9,000	7	1.21	8.47
Bill Jones	6,500	3	1.26	3.78
Jim Johnson	18,500	6	1.15	6.90
	$55,000	26		30.00

$$\text{Attitude Index} = \frac{\text{Weighted Attitude Score}}{\text{Attitude Weight}} = \frac{30}{26} = 1.15$$

Dollarized Attitudes (Expected Value of Employees) =

$$\$55,000 \times 1.15 = \$63,250$$

$$\text{Gain} = \$63,250 - \$55,000 = \$8,250$$

$$\text{Gain per person} = \frac{\$8,250}{5} = \$1,650$$

Source: M. Scott Myers and Vincent S. Flowers, "A Framework for Measuring Human Assets," California Management Review (Vol. XVI, No. 4, Summer 1974), p. 12.

Discussion of the Model

As in the Likert model, the application of this model for estimating a dollar value of a firm's human resources appear to culminate in a crude and subjective outcome. The subjectivity of the outcome is mainly due

to the difficulty of measuring an employee's attitude score. Therefore, a miscalculation of employees' attitude scores could significantly affect the outcome of the model. This is shown in Table 2-2, in which all the data are the same as those in Table 2-1, except the attitude scores.

TABLE 2-2

DOLLARIZED ATTITUDES (REVISED)

Individual	Annual Salary	Attitude Weight	Attitude Score	Weighted Attitude Score
John Doe	$14,000	5	.51	2.55
Mary Brown	7,000	5	.73	3.65
Harry Smith	9,000	7	.65	4.55
Bill Jones	6,500	3	.45	1.35
Jim Johnson	18,500	6	.75	4.50
	$55,000	26		16.60

Attitude Index = $\frac{16.60}{26}$ = .64

Dollarized Attitude = $55,000 x .64 = $35,200

Deficit = $55,000 - $35,200 = $19,800 Deficit per person = $3,960

Source: M. Scott Myers and Vincent S. Flowers, "A Framework for Measuring Human Assets," California Management Review (Vol. XVI, No. 4, Summer 1974), p. 13.

As can be seen, when a different attitude score is used, the expected value of these employees drops from $63,250 to $35,200 with a deficit of $19,800 instead of a gain of $8,250. Such a wide dispersion in the outcome,

indeed, seems less helpful and more confusing in decision making, because a sound basis yet is not available for excluding the personal bias in the calculation of the attitude scores of employees. Furthermore, application of this model for "dollarizing attitude" and quantifying a firm's human resources appears to be rather expensive and impractical, because the attitude score should be determined for each employee individually.

In summary, this model may provide management some useful but expensive and subjective information. However, such information may not be accepted widely by external users of accounting data because of its high degree of subjectivity.

The Frantzreb, Landau, and Lundberg Model

Description of the Model

This model is based on the assumption that "for each person in the organization, a roughly constant proportion exists between salary and contributions in excess of salary, benefits, and other expenses associated with the individual."[15] Accordingly, the economic value of an employee can be estimated by utilizing the employee's future salary and the relationship between his salary and his contributions to his employing firm. This valuation process regarding two individual employees is demonstrated in the following hypothetical example, presented in Table 2-3.

Column 1 of Table 2-3 shows the expected future salaries of employees A and B. The cumulative probability of these employees' staying with the firm is calculated and demonstrated in column 2. The product of these two columns, which represents the expected future outlay of salaries, is shown in column 3. The productivity factor of these two employees, based on their experience, tenure, and age, appears in column 4. Column 5, which is the product of column 3 and 4, represents the expected future contributions of these individuals. The present value of expected future contributions of these individuals, at a 10% rate of discount, is shown in column 6. The aggregates of these present values show surrogates for the value of these individuals to the firm.

Discussion of the Model

In contrast to the preceding models, this model seems more comprehensive in some respects. For instance, it utilizes not only the present salaries of employees, but also their future salaries. Moreover, this model includes some probability factors concerning the separation of employees calculated on the basis of the experience of the firm. However, when examined on the basis of the previously mentioned criteria, this model also falls short in practicality. To make the model operational, probabilities should be determined for each employee concerning his future salary, the duration he will stay with the company, and his productivity. At least two problems arise

TABLE 2-3

DETERMINATION OF THE EXPECTED VALUE OF TWO EMPLOYEES

Year of Service	1 Expected Salary	2 Cumulative Probability of Staying	3 Expected Outlay of Salary	4 Productivity Factor	5 Expected Contribution	6 Present Value
			Employee A			
1	$10,000	.80	$8,000	.50	$4,000	$ 3,636
2	10,500	.50	5,250	.80	4,200	3,471
3	11,000	.30	3,300	.85	2,805	2,107
4	11,500	.25	2,875	.90	2,588	1,768
5	12,000	.20	2,400	.95	2,280	1,416
6	12,500	.19	2,375	.98	2,328	1,314
						$13,712
			Employee B			
1	$ 9,000	.80	$7,200	.85	$6,120	$ 5,564
2	9,500	.75	7,125	.90	6,413	5,300
3	10,000	.70	7,000	.95	6,650	4,996
4	10,500	.69	7,245	.98	7,100	4,849
5	11,000	.67	7,370	.99	7,296	4,530
6	11,500	.65	7,475	.99	7,400	4,177
						$29,416

Source: R. B. Frantzreb, L. T. Landau, and D. P. Lundberg, "The Valuation of Human Resources," Business Horizons (June, 1974), p. 78.

in estimating such probabilities. First, because these probabilities should be estimated for all employees, this method of measuring a firm's human resources is very difficult and expensive. Second, estimation of the productivity factor on an individual basis is highly subjective, because no employee usually renders services and contributes to the well-being of his employing firm without some physical or mental assistance from other employees. The disaggregation of such combined and joint efforts and the estimation of productivity factor of each employee, therefore, demand for a subjective judgment.

The determination of an objective discount rate is another questionable aspect of this model. Its builders have suggested "any reasonable discount rate" including the cost of capital. The latitude and the arbitrariness in determining a discount rate add more to the subjectivity of the model.

In short, the three aforementioned shortcomings reduce the objectivity, the applicability, and the utility of the model for calculating an aggregate, as well as individual, value of a firm's employees. The model may have some limited utility for managerial decision making function, but not much utility for external reporting purposes.

The Hermanson Model

Description of the Model

This model is basically similar to the preceding one with two exceptions. First, the model attempts to estimate the value of a firm's human resources on an aggregate basis rather than on an individual employee basis. Second, the model utilizes a "productivity factor" that should be determined by a comparison between a firm's performances and the average performances of all other firms in the economy. The calculation of a firm's human resources, accordingly, consists of the following steps:

1. Estimation of future salaries of employees in aggregate,
2. Calculation of the present value of the future salaries,
3. Determination of a "productivity factor," or as Professor Hermanson called "efficiency ratio," and
4. Multiplication of the present value of future salaries by the efficiency ratio.

These steps are shown in the following hypothetical case.

TABLE 2-4

COMPUTATION OF THE PRESENT VALUE OF A FUTURE STREAM OF PAYMENTS TO HUMAN RESOURCES

Year	Dollar Amount	Present Value of $1 at the End of the Year at 6%	Present Value of the Future Payments Discounted at 6%
1	$100,000	.943	$ 94,300
2	120,000	.890	106,800
3	135,000	.840	113,400
4	140.000	.792	110,880
5	150,000	.747	112,050
	$645,000		$537,430

Source: Roger H. Hermanson, "Accounting for Human Asset," occasional paper No. 14 (September 25, 1964, Michigan State University), p. 16.

In the above case, only five future years of employees' salaries were used. The product of the present value of future salaries and the "efficiency ratio" thus gives an estimate of the value of human resources. This estimate would be $752,402, if the "efficiency ratio" is 1.4; (537,430 x 1.4 = 752,402).

The value of human resources can be shown in the asset section and the present value of future salaries in the liability section of the balance sheet as indicated below in the general journal entries.

	Dr.	Cr.
Human Resources (Operational Assets)	752,402	
Future Wages Payable		537,430
Excess Worth Created by Human Resources		214,972

As can be seen, the difference between asset and liability accounts for human resources is recorded in "Excess Worth Created by Human Resources" account and is shown in the owners' equity section of the balance sheet.[16]

Discussion of the Model

A very difficult aspect of this model is the determination of the "efficiency ratio." Professor Hermanson recommended the following formula for calculating such a ratio.

$$\text{Efficiency Ratio} = \frac{5\left(\frac{R_{F_0}}{R_{E_0}}\right) + 4\left(\frac{R_{F_1}}{R_{E_1}}\right) + 3\left(\frac{R_{F_2}}{R_{E_2}}\right) + 2\left(\frac{R_{F_3}}{R_{E_3}}\right) + 1\left(\frac{R_{F_4}}{R_{E_4}}\right)}{15}$$

Where:

R_{F_0} = The rate of accounting income on owned assets for the firm for the current year.

R_{E_0} = The average rate of accounting income on owned assets for <u>all</u> firms in the economy for the current year.

R_{F_4} = The rate of accounting income on owned assets for the firm for the fourth year previous.

R_{E_4} = The average rate of accounting income on owned assets for all firms in the economy for the fourth year previous.[17]

This ratio measures "the effectiveness of the human resources operating in a given entity over a five-year period."[18] Therefore, a ratio greater than "1" indicates that the rate of return for a firm is above the average rate for all firms in the economy.[19]

This ratio appears to be a useful and powerful tool for both managers and external users of accounting data. However, this ratio has been criticized as being subjective and not very accurate because of its use of such a broad statistic as R_E, "the average rate of accounting income on owned assets for all firms in the economy."[20] For instance, as Professor Geoffrey Baker stated, "use of such broadly based statistics appears to blur the precision of these calculations" and "to import unrelated risk factors into the efficiency ratio calculation."[21] Moreover, as in the preceding models, the determination of a proper and objective discount rate for the purpose

of calculating present value of future salaries, is also a problematic aspect of the model.

The Lev and Schwartz Model

Description of the Model

Because of the difficulty of calculating objectively either productivity factor of an employee or the efficiency ratio of human resources of a firm, Lev and Schwartz have proposed a model that utilizes information about employees' future salaries only. These authors believe that in normal circumstances the close correlation between an employee's compensation and his value to his employing firm allows utilization of salary as a surrogate for value of a firm's human resources.

In designing their model, these individuals have employed the economic concept of "human capital" and the measurement approach suggested by S. W. Petty around 1691.[22] To them "the value of human capital embodied in a person of age 'n' is the present value of his remaining future earnings from employment."[23] This value was suggested to be determined through the following formula:

$$V_n = \sum_{t=n}^{T} \frac{I(t)}{(1+r)^{t-n}}$$

Where: V_n = the human capital value of a person 'n' years old.

$I(t)$ = the person's annual earnings up to retirement.

r = a discount rate specific to the person.

T = retirement age.[24]

Inasmuch as information about I(t) is not readily available before a person is retired, these authors suggested utilization of estimates based on mortality tables and census data. They contend that the use of census data concerning employees future salaries would enhance objectivity of the model. The following steps are recommended for calculating value of human resources of a hypothetical firm.

The first step requires classification of employees into homogeneous groups according to age, level of skill, type of service, and assignments. Table 2-5 shows such a classification in the above mentioned hypothetical firm.

TABLE 2-5

DISTRIBUTION OF EMPLOYEES BY AGE AND SKILL

Age	Unskilled	Semi-skilled	Skilled	Profes-sionals	Total
25-34	700	--	10	40	750
35-44	300	40	10	30	380
45-54	--	10	20	20	50
55-64	--	--	--	10	10
Total	1,000	50	40	100	1,190

Source: Baruch Lev and Aba Schwartz, "On the Use of the Economic Concept of Human Capital in Financial Statements," The Accounting Review, Vol. XLVI (January 1971), p. 111.

The second step is the estimation of annual earnings for each group of employees, based on a reliable source such as United States census. Table 2-6 shows this step.

TABLE 2-6

AVERAGE ANNUAL EARNINGS CLASSIFIED BY AGE AND SKILL

Age	Unskilled	Semiskilled	Skilled	Professional
25-34	$5,000	$6,000	$7,500	$10,000
35-44	5,500	7,000	8,000	12,000
45-54	6,000	7,500	9,000	13,000
55-64	5,500	7,000	9,000	15,000

Source: Baruch Lev and Aba Schwartz, "On the Use of the Economic Concept of Human Capital in Financial Statements," The Accounting Review, Vol. XLVI (January 1971), p. 111.

The third step is the calculation of the present value of the earnings of each group of employees. To complete this step, information from mortality tables should be included. Table 2-7 demonstrates how the present value of expected future earnings of 700 unskilled employees could have been calculated.

TABLE 2-7

PRESENT VALUE OF FUTURE EARNINGS

Age	Average Annual Earnings		Number of Employees	Discount Factors		Present Value of Employees
25-34	$5,000	x	700	x 6.1446	=	$21,506,100
35-44	5,500	x	700	x 6.1446 x .3856	=	9,122,130
45-54	6,000	x	700	x 6.1446 x .1487	=	3,837,600
55-64	5,500	x	700	x 6.1446 x .0573	=	1,355,770
Total Value of 700 Unskilled Employees						$35,821,600

The preceding calculations were based on the assumption that all the 700 employees were 25 years old and would work until 65 years of age, the time of retirement. The figure 6.1446 used in the above calculation represents the present value of annuity of $1 at 10% discount rate; and figures .3855, .1486, and .0573 are the present values of $1 to be received in the next 10, 20, and 30 years, respectively.

A similar approach was used for calculating the present value of future earnings of other groups of employees. Table 2-8 shows the present value of future earnings of other groups and the total value of the firm's human resources.

TABLE 2-8

TOTAL VALUE OF HUMAN CAPITAL (DOLLARS) BY AGE AND SKILL (CAPITALIZATION RATE 10%)

Age	Unskilled	Semi-skilled	Skilled	Profes-sionals	Total
25-34	$35,821,600*	$ --	$ 764,310	$ 4,281,760	$40,867,670
35-44	15,908,400	2,686,880	786,990	3,546,990	22,929,260
45-54	--	626,670	1,529,540	2,308,440	4,646,650
55-64	--	--	--	921,600	921,600
Total	51,730,000	3,313,550	3,080,840	11,058,790	69,183,180

*The difference between this figure and that shown by Lev and Schwartz is due to the rounding.

Source: Baruch Lev and Aba Schwartz, "On the Use of the Economic Concept of Human Capital in Financial Statements," The Accounting Review, Vol. XLVI (January 1971), p. 111.

Discussion of the Model

The Lev and Schwartz model has at least four shortcomings. One, the model approaches the valuation problem of human resources from a macro-economic viewpoint by simply considering the capitalized future earnings of individuals as a surrogate for their economic value. This approach does not appear to be very sound for valuing individuals from a firm's (micro-economic level) viewpoint. The model tacitly assumes that all employees of a firm will remain with the firm until the time of their retirement. This assumption seems rather unrealistic, because employees usually change employment before they reach the retirement age. Consequently, the value calculated by the model

represents mostly the value of employees to themselves and to the economy as a whole (macro level), rather than to their employing firm. The value of employees to their firm could be estimated roughly by capitalizing the compensation that they will receive from a particular firm, and not by capitalizing the life-span earnings, including those that may come from other employing firms.

Two, to enhance the objectivity of the measurement, the builders of the model recommended the use of widely based statistics such as United States Census data for determining average earnings of different groups of employees. Application of such average and uniform data about earnings of employees would remove from the calculation the impact of an important variable, namely the actual compensation of each employee. The use of census data, consequently, would culminate in the calculation of "a value of the average rather than any specific group" of employee and therefore would "drastically limit the usefulness of the measure."[25] Accordingly, "it would be valueless to monitor the efficiency of an individual firm's investment in employee development, in that the investment would have little or no impact on this valuation."[26] Moreover, because of utilization of average and uniform data, such a measurement when reported by different firms on their financial statements, would not enhance the comparability aspect of the statements.

Three, from a firm's viewpoint the calculated figure is more indicative of the present value of future costs of employees than the present value of future contributions of employees to the firm. Therefore, the model determines the cost of a firm's human resources, not value. For that reason, the model should also include other costs relating to human resources, such as unamortized cost of recruiting, training, and developing employees to reflect the total cost of a firm's human resources.

Four, this model, like the others, suffers from the arbitrary selection of the discount rate. In other words, the outcome of the model can be significantly affected by the discount rate selected arbitrarily by the measurer.

The Flamholtz Current Replacement Cost Model

Description of the Model

The concept of replacement cost was first suggested by Professor Likert and was used by Professor Flamholtz for measuring a firm's human resources. Professor Flamholtz refers to two types of the replacement cost concept, that is "individual replacement cost" and "positional replacement cost."

Individual replacement cost refers to "the sacrifice that would have to be incurred today to replace an individual with a substitute capable of providing a set

of services equivalent to that of the individual being replaced."[27] Such costs are said to reflect the value of employees to their employing firms.

Flamholtz has recognized that a person is not valuable to an organization in an abstract sense. The value of an individual is related to the position he currently has and those he would be expected to occupy in the future. Therefore, he defines positional replacement cost as "the sacrifice that would have to be incurred today to replace an individual in a specific position with a substitute capable of providing an equivalent set of services in the given position."[28]

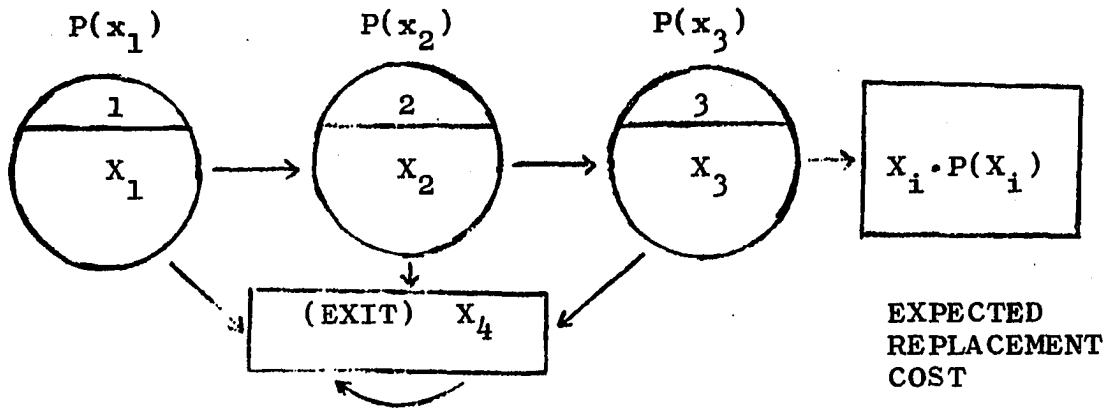
Therefore, in contrast to the individual replacement cost, the positional replacement cost refers "not to the cost of replacing a given individual but to the cost of replacing the set of services required of any incumbent in a specified position."[29] This type of valuation requires the following steps.

1. Identification of the service states that an employee might occupy in future (for example next five years),
2. Measurement of the employee respective positional replacement cost, and
3. Estimation of the probability that the employee would occupy each state at the expected time.[30]

The following schematic model attempts to depict the aforementioned steps.

EXHIBIT 2-1

MODEL FOR VALUATION OF INDIVIDUALS IN ORGANIZATIONS



Source: Eric G. Flamholtz, "The Theory and Measure of an Individual's Value to an Organization," Unpublished Dissertation, University of Michigan, 1969, p. 52.

In this schematic model, each circle represents a service state (a position or the state of exit) that an employee can potentially occupy at a specific point in time. "The states numbered 1 through 3 represent actual organizational positions, while state 4 represents the condition of having exited from the organization. The probabilities that the individual will occupy each possible mutually exclusive state are denoted $P(X_1)$, $P(X_2)$, . . . and $P(X_n)$. The positional replacement costs associated with each state is denoted $X_1, X_2, \ldots, X_n$."[31] The aggregate of positional replacement cost of states, after adjustment is made for the pertinent probability, represents the expected replacement cost of an individual.

Discussion of the Model

The applicability of the replacement cost concept

in valuation of physical assets has been questioned on the grounds that changes in technology may not permit replacing one asset with an identical one. This problem seems even more serious in the valuation of a firm's human resources because individuals, especially in higher levels of an organization, are unique in their talents and capacities.

The validity of the replacement cost concept, however, is defensible if such a cost is determined for an asset on the basis of "like use," rather than "identical substance." In other words, the substitute asset need not be identical but should provide similar services as the original asset. This concept was apparently used by Professor Flamholtz in building his "positional replacement cost model."

The applicability of this model, nonetheless, is limited because it demands considerable amount of estimation. Moreover, utilization of this model for determining a positional replacement cost of the entire human resources of an organization would be a very costly operation. In short, there is some doubt whether (a) this model would furnish information of sufficient precision for making managerial and investment decisions and (b) preparation of such information is economically feasible for an average business organization. Nevertheless, this model could provide some useful information for management in making certain managerial decisions.

The Acquisition Cost Model

Description of the Model

Traditionally, a measure of historical cost has been used by accountants for two main reasons (a) to avoid the difficulties involved in economic value measurement, and (b) to protect themselves against criticisms concerning the subjectivity of the measurement.[32] Because of assumed objectivity, traceability, and unambiguity of the acquisition cost data, the acquisition cost concept has been contended useful for estimating the cost of a firm's human resources.

The first measurement model utilizing acquisition cost data relating to human resources of an organization was developed by Professors Likert, Pyle, Brummet, and Flamholtz in 1966. This model was then adopted by R. G. Barry Corporation in 1967 for determining a monetary measure for the firm's human resources by aggregating explicit costs related to these resources. These costs are accumulated in seven individual subsidiary accounts for each employee under the following headings: recruiting, acquisition, formal training and familiarization, informal training, familiarization, investment building experience, and development. A brief description of these costs appears in Exhibit 2-2. These costs are later amortized according to the "matching principle." Exhibit 2-3 shows the conventional and human resource statements of R. G. Barry for 1973, in

EXHIBIT 2-2

Elements of Acquisition Cost

1. Recruiting outlay costs--Costs associated with locating and selecting new (management) personnel. This category includes search fees, advertising, interviewer or interviewee travel expenses, allocations of personnel, and acquiring department time for internal screening, interviewing, testing, and evaluation expenses. Outlay costs for unsuccessful candidates are allocated to the cost of obtaining the candidate hired.

2. Acquisition costs--Costs incurred in bringing a new man 'on board'. This category includes placement fees, moving costs, physical examination, allocation of personnel, and acquiring department time in placing a man on the payroll and situating him with the necessary equipment to perform his job.

3. Formal training and Familiarization costs--Costs normally incurred immediately after hire or possible transfer from one location to another. These refer to normal orientation programmes, vestibule training, etc.

4. Informal Training Costs--Costs associated with the process of teaching a new person to adapt his existing skills to the specific job requirements of his new job. The costs related to this process are normally salary allocations only and vary with each position depending upon the level of the job in the organization, number of subordinates, interaction patterns outside the department, etc.

5. Familiarization Costs--Costs associated with the very complex process of integrating a new manager into the organization to the point where he can be a fully effective member. Such costs include learning the company's philosophy, history, policies, objectives, communications patterns, past practices, procedures, understanding of the people with whom the new position-holder will regularly interact. These costs, which can be sizable, depending upon the level and scope of the position, include salary allocations.

6. Investment Building Experience Costs--Costs associated with investments in on-the-job training which occur after the initial familiarization period and which are expected to have value to the company beyond the current accounting period. Investment building experience is the development of a capability which would not reasonably be expected as a normal part of the person's job.

7. Development Costs--Costs associated with investment in increasing a manager's capabilities in areas beyond the specific technical skills required by the position. In this category are management seminars, university programs or courses, etc. Costs are collected by means of a 'Training X Development Requisition', and are modified by the participant's evaluation of the pertinency of the study.

Source: R. L. Woodruff, Jr. "Human Resource Accounting", Canadian Chartered Accountant, September, 1970, pp. 157, 158.

EXHIBIT 2-3

R. G. Barry Corporation and Subsidiaries
Pro-Forma
(Conventional and Human Resource Accounting)

Balance Sheet

Assets	1973 Conventional and Human Resource	1973 Conventional Only
Total Current Assets	$18,311,713	$18,311,713
Net Property, Plant and Equipment	3,500,227	3,500,227
Excess of Purchase Price over Net Assets Acquired	1,285,829	1,285,829
Deferred Financing Costs	173,278	173,278
Net Investments in Human Resources	1,964,243	—
Prepaid Income Taxes and Other Assets	213,500	213,500
	$25,448,790	$23,484,547
Liabilities and Stockholders' Equity		
Total Current Liabilities	3,909,083	3,909,083
Long Term Debt, Excluding Current Installments	6,970,000	6,970,000
Deferred Compensation	143,150	143,150
Deferred Income Tax Based Upon Full Tax Deduction for Human Resource Costs	982,122	—
Stockholders' Equity:		
Capital Stock	1,902,347	1,902,347
Additional Capital in Excess of Par Value	5,676,549	5,676,549
Retained Earnings:		
Financial	4,883,418	4,883,418
Human Resources	982,121	—
	$25,448,790	$23,484,547

Statement of Income

Net Sales	$43,161,564	$43,161,564
Cost of Sales	28,621,050	28,621,050
Gross Profit	14,540,514	14,540,514
Selling, General and Administrative Expenses	10,783,922	10,783,922
Operating Income	3,756,592	3,756,592
Interest Expense	598,846	598,846
Income Before Income Taxes	3,157,746	3,157,746
Net Increase in Human Resource Investment	184,293	—
Adjusted Income Before Income Taxes	3,342,039	3,157,746
Income Taxes	1,615,147	1,523,000
Net Income	$ 1,726,892	$ 1,634,746

which the unamortized portion of such costs is reported.

Discussion of the Model

The acquisition cost model is considered to be pragmatic and beneficial to the external users of financial data because of "(a) its objectivity, (b) its facilitation of comparison on levels of human resource investment on a basis consistent with accounting treatment of other assets, and (c)" its "fairer matching of benefits exhaustion with expense in particular time periods."[33] Consequently, the monetary measure of a firm's human resources, calculated by this model can provide useful information to both internal and external users of accounting data. Despite its various anticipated utilities, this measurement model, like the Lev and Schwartz model, falls short in measuring and representing the total cost of a firm's human resources. This is because the model accumulates a part of employees' acquisition costs and ignores the aggregate costs of employees' potential services. Even though the ignored costs are normally incurred periodically through employees' compensation, they represent part of the total costs of a firm's human resources and thus should be utilized by the model if full utility of the surrogate is expected. The following hypothetical example demonstrates the misleading conclusion that may be reached by users of financial statements, if this model is used for calculating and reporting a monetary measure of a firm's human resources.

Two firms, A and B, hired two individuals, X and Y, respectively. Individual X has an MBA degree and sufficient managerial training and experience. Because of these characteristics, Firm A did not incur additional training cost to fit Individual X into its organization. On the contrary, Individual Y has inadequate training in management and must complete formal training courses at additional costs to Firm B. However, he is paid considerably less than Individual X.

After completing his training courses, Individual Y becomes as efficient as Individual X. Now if the foregoing acquisition cost model is used for measuring and reporting human resources of these firms, the balance sheet of Firm B would show higher human resources than the balance sheet of Firm A, because of the practice of capitalizing the company-paid training cost of Individual Y., and ignoring the self-paid training cost of Individual X. As a result, whenever these two firms are compared, the lower human resources reported on the balance sheet of Firm A is likely to be interpreted to mean that its human resources are less valuable than those of Firm B. This may not be true, because human resources of both firms may be equally efficient.

Summary

In this chapter, the following seven measurement models for human resources were briefly discussed: , the Likert socio-psychological model; the Scott Meyers and Vincent Flowers model; the Frantzreb, Landau, and Lundberg model; the Hermanson model; the Lev and Schwartz model; the Flamholtz current replacement cost model; and the acquisition cost model.

All these models, though possessing certain unique attributes, fall short in some respects. For instance, the Likert socio-psychological model provides some useful non-monetary information about a firm's human resources. However, the conversion of such a non-monetary information to monetary information seems to reduce the objectivity of the model. The application of the Scott Meyers and Vincent Flowers model for "dollarizing attitude" of employees and quantifying a firm's human resources appears to be rather expensive and impractical, because an attitude score should be determined for each employee individually.

The Frantzerb, Landau, and Lundberg model, while more comprehensive than the others in some respects, is not highly pragmatic for external reporting purposes for two reasons--the expensiveness of the application and the subjectivity of the outcome. The expensiveness of the application is due to the fact that the model asks for the determination of such factors as the future salaries of

each employee, the duration of his future stay, and his productivity factor. The subjectivity of the outcome is related to the calculation of the probability associated with the above factors, in addition to the determination of a reliable rate of discount.

The Hermanson model, likewise, may yield a subjective measure of a firm's human resources because of its use of such a broadly based statistic as "the average rate of accounting income on owned assets for all firms in the economy." This model also uses an arbitrary rate of discount that further reduces the objectivity of the model.

The Lev and Schwartz model also uses an arbitrary discount rate and excludes such human resource costs as costs of recruiting, training, and developing employees. Moreover, the model approaches the valuation process from the macro-economic viewpoint. Thus, the calculated measure is more indicative of the employees' value to themselves than to their employing firms. Finally, because average earnings for employees are obtained from census data, this model does not reflect the impact of the actual earnings of the employees.

The Flamholtz replacement cost model also falls short in providing highly useful information to the external users because (a) information lacks sufficient precision and (b) not economically applicable to an average organization. However, that model could provide some useful information

to management and the internal users.

The acquisition cost model, like the Lev and Schwartz model, does not include all pertinent cost of a firm's human resources. In other words, the model utilizes only such explicit costs as costs of recruiting, training, and developing employees. These costs, indeed, are not all the costs related to a firm's human resources.

Chapter III will present a proposed measurement model that includes all pertinent costs of a firm's human resources in addition to being more objective and reliable.

FOOTNOTES

[1]Eldon S. Hendriksen, Accounting Theory (Homewood, Illinois, 1970), p. 260.

[2]Ibid., p. 282.

[3]Rensis Likert, The Human Organization, Its Management and Value (New York: McGraw-Hill Book Company, 1967), p. 78.

[4]Ibid., p. 78.

[5]"Report of the Committee on Human Resource Accounting," The Accounting Review (Supplement to Vol. XLVIII, 1973), p. 176.

[6]Ibid., p. 176.

[7]Ibid., p. 177.

[8]Lawrence D. Prybil, "Job Satisfaction in Relation to Job Performance and Occupational Level," Personnel Journal, Vol. 52, No. 2 (February 1973), p. 94.

[9]Ibid., p. 94.

[10]Ibid., p. 94.

[11]Donald Bowen and Jacob P. Siegel, "Relationship between Satisfaction and Performance: The Question of Causality," Proceedings of the 78th Annual Convention of the American Psychological Association, 1970, p. 584.

[12]Hendricksen, Accounting Theory, p. 112.

[13]M. Scott Myers and Vincent S. Flowers, "A Framework for Measuring Human Assets," California Management Review, Vol. XVI, No. 4 (Summer 1974), pp. 6, 10.

[14]Ibid., p. 12.

[15]Richard B. Frantzrel, Linda L. T. Landau, and Donald P. Lundberg, "The Valuation of Human Resources," Business Horizon, Vol. 17, No. 3 (June 1974), p. 75.

[16]Roger H. Hermenson, "Accounting for Human Assets," Occasional paper No. 14, Bureau of Business and Economic Research, Graduate School of Business Administration, Michigan State University, East Lansing, 1964, p. 17.

[17]Ibid., p. 16.

[18]Ibid., p. 16.

[19]Ibid., p. 17.

[20]Ibid., p. 16.

[21]Geoffrey M. N. Baker, "Human Resource Accounting: A Critical View," Michigan State University Business Topics (Autumn,1973), p. 49.

[22]B. F. Kiker (ed.), Investment in Human Capital (Columbia, South Carolina: University of South Carolina Press, 1971), p. 52.

[23]Baruch Lev and Aba Schwartz, "On the Use of the Economic Concept of Human Capital in Financial Statements," The Accounting Review, Vol. XLVI, No. 1 (January 1971), p. 105.

[24]Ibid., p. 105.

[25]Geoffrey M. N. Baker, "The Feasibility and Utility of Human Resource Accounting," California Management Review, Vol. XVI, No. 4 (Summer 1974), p. 19.

[26]Ibid., p. 19.

[27]Eric G. Flamholtz, "Human Resource Accounting: Measuring Positional Replacement Costs," Human Resource Management, Vol. 12, No. 1 (Spring 1973), p. 10.

[28]Ibid., p. 10.

[29]Ibid., p. 10.

[30]Eric G. Flamholtz, "The Theory and Measure of an Individual's Value to an Organization," Unpublished Dissertation, University of Michigan, 1969, p. 50.

[31]Ibid., p. 52.

[32]Eric Flamholtz, "A Model for Human Resource Valuations: A Stochastic Process with Service Rewards," The Accounting Review, Vol. XLXI, No. 2 (April 1971), p. 263.

[33]Baker, "The Feasibility and Utility of Human Resource Accounting," p. 19.

CHAPTER III

A PROPOSED MEASUREMENT MODEL

Introduction

In Chapter II, seven measurement models, including the acquisition cost model and the Lev and Schwartz model were analyzed, and the shortcomings and the attributes of each were discussed. The above two models are of particularly relavance to this chapter because their underlying assumptions were used in the development of the proposed model.

Despite some of its theoretical supports, the acquisition cost model was criticized because it excludes from its operational framework an important element of the costs of a firm's human resources. This cost is the "implicit purchasing price of employees' potential services." Although paid gradually through employees' compensation, this price (cost) should be included in a monetary measure of a firm's human resources if additional utility of the measure is to be expected.

The suggestion of including the implicit purchasing price of employees' potential services in the measurement model may appear difficult to accept. However, such an

inclusion can be justified by contrasting the acquisition of human resources with that of a tangible asset.

To acquire a piece of equipment, a firm usually incurs such preliminary acquisition costs as research and investigation, ordering, transportation, insurance, inspection, handling, and installation costs. The aggregate of these preliminary acquisition costs, however, does not represent the total costs of the equipment that are the aggregate of the preliminary acquisition costs and the "invoice price" of the equipment, regardless of the price paid in installments.

The same logic can be applied to the cost of a firm's human resources. In that case also, the total cost consists of two segments, one representing explicit acquisition costs of such items as recruiting, training, and developing employees and the other representing the "invoice price" or the implicit purchasing price of employees' potential services.

The latter cost is generally influenced by the employees' level of education, training, skill, experience, good health, and contributions to the well-being of the employing firm. Because all the foregoing factors either directly or indirectly affect the employee's level of compensation, the purchasing price of employees' potential services may be estimated through the adjusted discount value of employees' future compensation.

Lev and Schwartz model also utilizes the discount value of employees' future earnings in determining the cost of human resources. However, like the acquisition cost model, the Lev and Schwartz model fails to include both segments of costs. In other words, in contrast with the acquisition cost model, the Lev and Schwartz model includes the discount value of employees' future earnings but excludes such human resource costs as costs of recruiting, training, and developing employees. Furthermore, the Lev and Schwartz model does not determine and utilize a discount rate. The determination of a discount rate is left to the measurer who could allow bias and subjectivity to enter into the calculation.

This chapter is, thus, devoted to the presentation of a proposed model that includes both segments of the costs of a firm's human resources. In other words, this model includes an estimate of the implicit purchasing price of employees' potential services, in addition to the costs of recruiting, training, and development employees. Moreover, the proposed model determines a rate of discount that is less subject to manipulation.

In addition to this chapter, Chapters V and VI are devoted to the presentation of the results and the conclusions of the empirical research concerning the usefulness of the proposed and the acquisition cost models through the investigation of the previously discussed research questions (page 3).

Discussion of the Proposed Model

As Exhibit 3-1 indicates, total costs of a firm's human resources conceptually are formed of two segments. The first segment represents investments made directly by the firm in human resources. These investments usually appear in the forms of recruiting, selecting, hiring, placing, familiarizing, training, and developing employees. The costs of these investments can be calculated satisfactorily through the acquisition cost model.

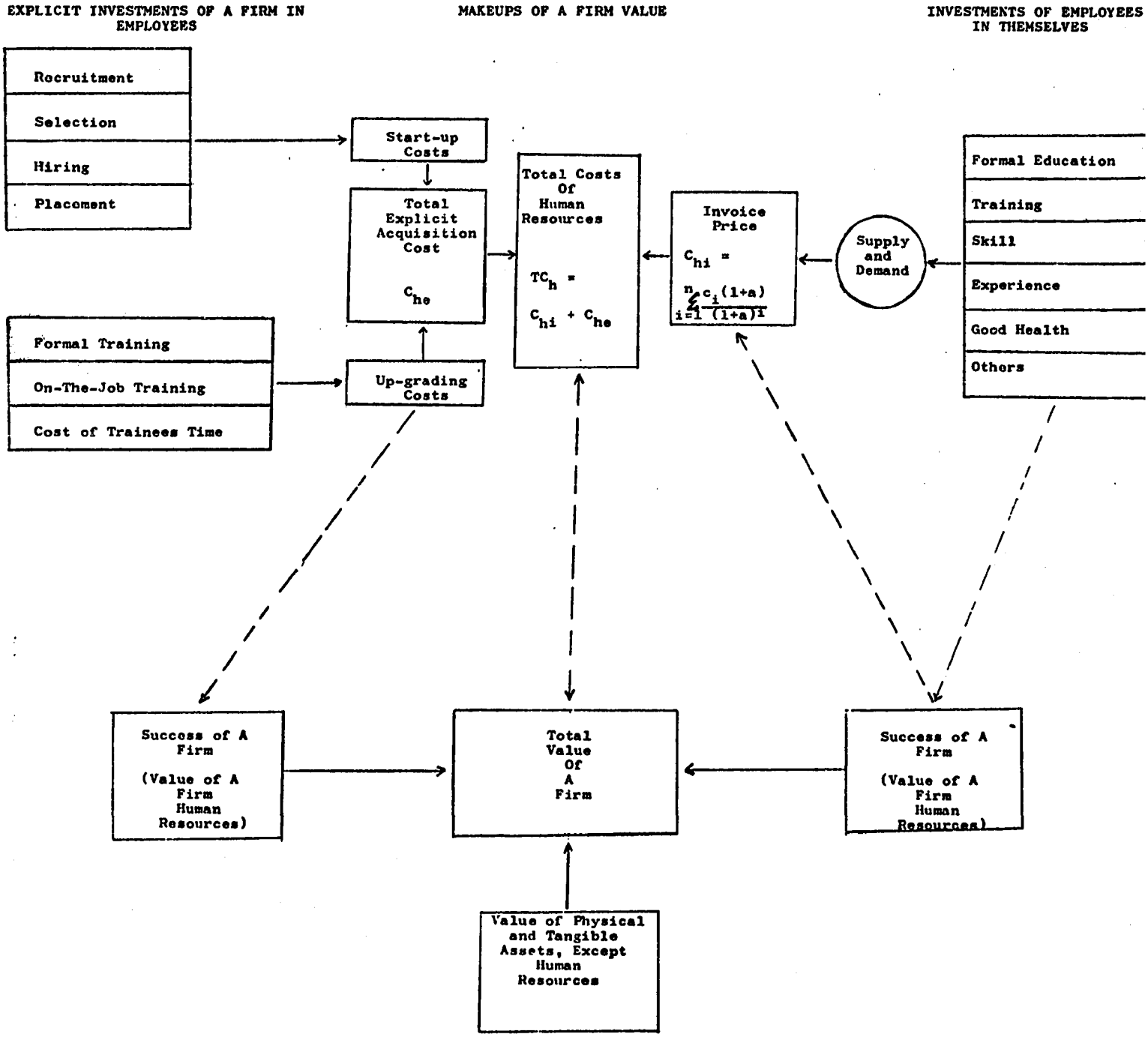
The second segment is the aggregate purchasing price of employees' future services (invoice price). This price is generally affected by employees' level of education, training, skill, experience, good health, and contributions to the firm. Such an aggregate purchasing price (cost) may be approximated through the following process.

Mechanical Aspect of the Model

The mechanics of the Internal Rate of Return method need to be described briefly, before the proposed model can be explained. In a hypothetical example a firm invests $300 in a project that generates net annual cash-inflows of $110, $121, and $133.1 for three successive years, starting from the date of the investment. No salvage value is expected after three years of operations. According to the Internal Rate of Return method, the rate of return on this project is 10 percent, as shown here:

EXHIBIT 3-1

PROPOSED MODEL



$$(1) \qquad C = \frac{F_1}{(1+a)^1} + \frac{F_2}{(1+a)^2} + \frac{F_3}{(1+a)^3}$$

$$300 = \frac{110}{(1+a)^1} + \frac{121}{(1+a)^2} + \frac{133.1}{(1+a)^3}$$

$$a = 10\%$$

Where: C = Original cost of the project

F = Annual net cash-inflow

a = Internal rate of return

In that example, the original cost of the project (C) and the annual net cash-inflows (F) were known factors. The only unknown factor was the internal rate of return (a), which was determined through the Internal Rate of Return method. The reader should keep in mind that in the above case relating to the investment in a tangible asset the original $300 cost of the asset was paid at the start of the investment project. Throughout the useful life of the project, each annual net cash-inflow, thus, is expected to cover gradually part of the original cost of the asset in addition to 10 percent return on uncovered portion of the original cost. That process is shown in the following calculations:

$$300 = \frac{110}{(1+.10)^1} + \frac{121}{(1+.10)^2} + \frac{133.1}{(1+.10)^3}$$

$$300 = \frac{100(1+.10)^1}{(1+.10)^1} + \frac{100(1+.10)^2}{(1+.10)^2} + \frac{100(1+.10)^3}{(1+.10)^3}$$

The process can finally be written in a form of a general formula as follows:

$$(2) \qquad C = \frac{c_1(1+a)^1}{(1+a)^1} + \frac{c_2(1+a)^2}{(1+a)^2} + \ldots + \frac{c_n(1+a)^n}{(1+a)^n}$$

or

$$C = \sum_{i=1}^{n} \frac{c_i(1+a)^i}{(1+a)^i}$$

Where: $C = c_1 + c_2 + \ldots + c_n$

As can be observed in an investment in a tangible asset, each annual net cash-inflow consists of two parts. One part (c_i) represents a portion of the original cost of the asset (C), recovered after "i" period ("i" stands for 1,2,3,...,n). The other part, namely $c_i(1+a)^i - c_i$, represents a return on the recovered cost (c_i) for "i" period at a compound interest rate of "a". The formula No. 2 also indicates that, after each portion of the original cost is recovered, that portion is no longer an effective factor in the formation of the annual net cash-inflows of the succeeding years.

However, in an investment in human resources, the original cost is not normally paid at the outset of the investment project but is paid gradually through employees' compensation with the hope that such outflows will generate sufficient earnings to cover (a) the annual compensation--a segment of the cost--and (b) a reasonable return on such compensation. This practice of paying the original cost over a period of time rather than in sum at the outset of the investment project has some effect on the formation

of the annual net cash-inflows, as shown in the following formula:

$$(3) \qquad C = \frac{c_1(1+a)}{(1+a)^1} + \frac{c_2(1+a)}{(1+a)^2} + \ldots + \frac{c_n(1+a)}{(1+a)^n}$$

Where: $C < c_1 + c_2 + \ldots + c_n$

The difference between formulas No. 2 and 3 is due to the absence of compound interest in the formation of the net annual cash-inflows, in the case of human resources.

Interestingly enough, formula No. 3 may be used for estimating the "implicit purchasing price of employees' potential services." This can be done by viewing $c_i(1+a)$ of formula No. 3 as the annual net cash-inflow of another investment project whose original cost is paid in sum at the outset of the project and its rate of return is equal to "a ". The original cost of such an investment project, in turn, is an estimate for the "implicit purchasing price of employees' potential services of a firm, for which the annual compensation is c_i and the rate of return on such a compensation is "a".

The following hypothetical example demonstrates the process.

A firm has only one employee with a 3-year useful life. The annual compensation of this employee is $100, and the expected rate of return to the firm on such a compensation cost is 10%. Based on these assumptions, the implicit purchasing price of the three years' service of

this employee to this particular firm is $273.55, at the beginning of the first year.

$$C = \frac{c_1(1+a)}{(1+a)^1} + \frac{c_2(1+a)}{(1+a)^2} + \frac{c_3(1+a)}{(1+a)^3}$$

$$C = \frac{100(1+.10)}{(1+.10)^1} + \frac{100(1+.10)}{(1+.10)^2} + \frac{100(1+.10)}{(1+.10)^3} = \$273.55$$

Determination of the Aggregate Rate of Return

In the preceding example the expected rate of return on the investments was assumed to be 10 percent. This rate, however, can be estimated more objectively through the following formula.

$$a = \frac{I}{C_p + C_{hi}}$$

Or (4) $$a \cdot (C_p + C_{hi}) = I$$

Where: a = Aggregate rate of return

I = Annual net income

C_p = Cost of physical and intangible assets, except human resources

C_{hi} = Implicit purchasing price of employees' potential services (for the sake of simplicity, the costs of recruiting, training, and developing employees are ignored. They will be included later).

As can be seen, the above calculated rate of return is the same as the conventional rate of return except it includes costs of physical assets, as well as human resources. The inclusion of the costs of human resources (C_{hi}) in the

calculation may be justified by visualizing a case in which a firm purchases physical assets on an installment basis. Even though the total cost of the assets is not paid at the time of purchase, it is normally used in calculating the first-year rate of return on the assets employed. Likewise, the total cost of the assets, after being adjusted for depreciation, is used in calculating the following years' rate of return, regardless of the installment payments. This practice, therefore, implies that the time of payment of the total cost is not a relevant factor in calculating the rate of return. The relevant factor is the availability of physical assets or human resources for utilization.

Consequently, because human resources of a firm are available after the recruitment date, the total costs of such resources should be included in the calculation of the rate of return on total assets employed, even though these costs are paid later gradually through employees' compensation.

Determination of the Implicit Purchasing Price

In equation No. 4, the factor C_{hi}, which represents the implicit purchasing price of employees' potential services, is not known. This factor and the aggregate rate of return can be easily estimated by solving equations 3 and 4 simultaneously.

$$(3) \qquad C_{hi} = \frac{c_1(1+a)}{(1+a)^1} + \frac{c_2(1+a)}{(1+a)^2} + \ldots + \frac{c_n(1+a)}{(1+a)^n}$$

$$(4) \qquad a \cdot (C_p + C_{hi}) = I$$

The only unknown factors are "a" and "C_{hi}". The other factors (such as "$c_{1,2,\ldots,n}$", which represent annual compensation; "I", which represents the annual net income of the firm; and "C_p", which represents the total cost of physical assets) are known factors.

Inclusion of Other Costs in the Model

In the previous calculations, such explicit costs of investments in human resources as recruiting, training, and developing employees were ignored for simplicity. These costs can be incorporated into the model easily in the following manner.

$$a \cdot (C_p + C_{hi} + C_{he}) = I$$

$$C_{hi} = \frac{c_1(1+a)}{(1+a)^1} + \frac{c_2(1+a)}{(1+a)^2} + \ldots + \frac{c_n(1+a)}{(1+a)^n}$$

Where:

a = Aggregate rate of return.

C_p = Cost of physical and intangible assets, except human resources.

C_{hi} = Implicit purchasing price of employees' potential services.

C_{he} = Explicit cost of investments in human resources (cost of recruiting, training, developing, and so forth).

Based upon the new model, the total cost of a firm's human resources may be estimated as follows:

$$TC_h = C_{he} + C_{hi}$$

Where TC_h represents a surrogate for the total cost of a firm's human resources.

Comparison of the Proposed Model with Conventional and Acquisition Cost Models

Exhibit 3-2 demonstrates three sets of financial statements for R. G. Barry Corporation. Sets 1 and 2 are similar to the financial statements that the company published for 1971. Set 1 is prepared on the basis of the conventional accounting principles. Hence, all the cash outlays related to recruiting, training, and developing employees (explicit acquisition costs) are viewed as period expenses and treated accordingly.

Set 2 is prepared on the assumption that some of the currently incurred costs of recruiting, training, and developing employees could benefit future operating periods. Such outlay costs are first capitalized, then gradually amortized according to the "matching principle." For this purpose, the acquisition cost model, discussed in the preceding chapter, was used in set 2.

Set 3 is prepared on the belief that inclusion of "explicit acquisition costs" alone (i.e., unexpired costs of recruiting, training, and developing employees) could

EXHIBIT 3-2

FINANCIAL AND HUMAN RESOURCE STATEMENTS
DECEMBER 31, 1971

BALANCE SHEET	Set #1	Set #2	Set #3
ASSETS:			
Total Current Assets ...	$12,810,346	$12,810,346	$12,810,346
Net Property, Plant and Equipment	3,343,379	3,343,379	3,343,379
Excess of Purchase Price over Net Assets Acquired	1,291,079	1,291,079	1,291,079
Net Investments in Human Resources:			
Unexpired costs of hiring, training employee.....	--	1,561,264	1,561,264
Discount value of 5-year adjusted compens.	--	--	53,647,760
Other Assets	209,419	209,419	209,419
Total Resources	$17,654,223	$19,215,487	$72,863,247
LIABILITIES AND STOCKHOLDERS' EQUITY:			
Total Current Liabilities	$ 3,060,576	$ 3,060,576	$ 3,060,576
Long Term Debt, Excluding Current Installments	5,095,000	5,095,000	5,095,000
Deferred Compensation ..	95,252	95,252	95,252
Liabilities Related to Discounted Compensation	--	--	52,676,875
Deferred Federal Income Taxes Based upon Full Deduction for Human Resource Costs	--	780,632	780,632
Stockholders' Equity:			
Capital Stock	1,209,301	1,209,301	1,209,301
Additional Capital in Excess of Par	5,645,224	5,645,224	5,645,224
Retained Earnings:			
Financial	2,548,870	2,548,870	2,548,870
Human Resources:			
Related to Costs of Hiring, etc.	--	780,632	780,632
Related to Discounted Compensation	--	--	970,885
	$17,654,223	$19,215,487	$72,863,247

EXHIBIT 3-2 (Continued)

STATEMENT OF INCOME	Set #1	Set #2	Set #3
Net Sales	$34,123,202	$34,123,202	$34,123,202
Cost of Sales	21,918,942	21,918,942	21,918,942
Gross Profit	$12,204,260	$12,204,260	$12,204,260
Selling, General and Administrative Exp.	9,417,933	9,417,933	9,417,933
Operating Income	$ 2,786,327	$ 2,786,327	$ 2,786,327
Other Deductions, Net	383,174	383,174	383,174
Income Before Federal Income Tax	$ 2,403,153	$ 2,403,153	$ 2,403,153
Net Increase in Human Resource Investment	--	137,700	137,700
Adjusted Income Before Federal Income Tax	$ 2,403,153	$ 2,540,853	$ 2,540,853
Federal Income Taxes	1,129,000	1,197,850	1,197,850
Net Income	$ 1,274,153	$ 1,343,003	$ 1,343,003

not always provide a comprehensive monetary measure of a firm's human resources. To enhance the scope of such a monetary measure, the "implicit purchasing price" of employees' potential services, estimated on the basis of the new measurement model, is also included in set 3. (Mathematical calculations are given in Appendix B).

Comprehensiveness and Completeness

As was mentioned previously, the conventional financial statements do not include information about the cost of a firm's human resources. The human resource statements prepared on the basis of the acquisition cost model include only such human resources costs as the costs of recruiting, training, and developing employees. This practice was previously criticized because it can culminate in some misinterpretation of a firm's human resources. This point was briefly discussed in the preceding chapter in the presentation of a hypothetical example of two firms utilizing different employment policies. A further demonstration of this point in another hypothetical situation is in order.

The users of the financial statements of two companies, A and B, are provided with additional sets of supplementary statements that are prepared on the basis of the acquisition cost model as in Exhibit 3-3. According to these statements, both companies have identical amounts

EXHIBIT 3-3

SUPPLEMENTARY FINANCIAL STATEMENTS OF TWO COMPANIES (BASED ON THE ACQUISITION COST MODEL)

ASSET SECTION OF THE BALANCE SHEETS

	COMPANY A	COMPANY B
Current Assets	$12,810,370	$12,810,370
Other Assets	4,842,000	4,842,000
Human Resources: Unexpired costs of recruiting, training, and developing employees	1,561,000	66,300
Total	$19,213,370	$17,718,670

INCOME STATEMENT

	COMPANY A	COMPANY B
Net Sales	$34,123,000	$34,123,000
Expenses:		
Employees Compensation	11,125,000	11,435,000
*Amortization of Employees recruiting, training, and developing costs	312,200	13,300
Other Expenses	20,145,000	20,133,900
Total Expenses	$31,582,200	$31,582,200
Net Income Before Tax	2,540,800	2,540,800
Income Tax	1,193,000	1,193,000
Net Income, HR	$ 1,347,800	$ 1,347,800

*The cost of recruiting, training, and developing employees would be amortized over a 5-year period.

of physical assets, net sales, and net income. However, their unexpired costs relating to recruiting, training, and developing employees differ in amount. This difference is probably due to the different employment policies. Company A usually trains its employees. Because of incurring and capitalizing employees' cost of training, this company shows $1,561,000 in the human section of its balance sheet. In contrast, Company B recruits already trained individuals and incurs insignificant cost of training. Because of this employment policy, Company B shows $66,300 in the human section of its balance sheet. Nonetheless, Company B pays a higher annual compensation than Company A, because trained individuals are hired. This practice of reporting only the unexpired cost of employees' recruiting, training, and developing could lead to the conclusion that human resources of Company A are more valuable and potential than those of Company B.

This possibly invalid conclusion may be avoided if employees' compensation, adjusted by employees' already demonstrated ability (i.e., earnings of the company), is shown in the human resource section of the balance sheets. Such balance sheets, prepared on the basis of the proposed model, appear in Exhibit 3-4. As can be seen, these balance sheets show not only the unexpired costs of recruiting, training, and developing employees, but also the discount value of 5-year adjusted compensation of employees. Such

EXHIBIT 3-4

SUPPLEMENTARY FINANCIAL STATEMENTS OF TWO COMPANIES (REVISED)
(BASED ON THE PROPOSED MODEL)

ASSET SECTION OF THE BALANCE SHEETS

	COMPANY A	COMPANY B
Current Assets	$12,810,370	$12,810,370
Other Assets	4,842,000	4,842,000
Human Resources:		
Unexpired costs of recruiting, training, and developing employees	1,561,000	66,300
Discount value of 5-year adjusted compensation	53,640,630	55,135,336
Total	$72,854,000	$72,854,006

INCOME STATEMENTS

	COMPANY A	COMPANY B
Net Sales	$34,123,000	$34,123,000
Expenses:		
Employees compensation	11,125,000	11,435,000
Amortization of Employees recruiting, training, and developing costs	312,200	13,300
Other Expenses	20,145,000	20,133,900
Total Expenses	$31,582,200	$31,582,200
Net Income Before Tax	2,540,800	2,540,800
Income Tax	1,193,000	1,193,000
Net Income	$ 1,347,800	$ 1,347,800

comprehensive and complete supplementary financial statements, therefore, should prevent the invalid conclusion mentioned previously and facilitate comparison of two or more companies, as far as human resources are concerned.

Analysis and Prediction

As shown in Exhibits 3-3 and 3-4, the supplementary human resource statements prepared on the basis of the proposed model can bring two companies with different personnel policies into a more comparable position. The use of the proposed model in measuring and reporting human resources also can bring companies with different make-up of resources into a more comparable situation. This point is illustrated in the following hypothetical example of two companies in the same industry with one company more automated and less labor oriented than the other company. Conventional financial statements of both companies are shown in Exhibit 3-5.

As can be seen, both companies have the same annual earnings, although Company Y utilizes automated equipment for the most part of its operations while Company X uses manpower instead. Neither company reports human resources in its financial statements, even though both utilize them in different degrees. However, Company Y reports its important resources (machinery and tangible assets), while Company X does not report its main and important resources (employees). A false conclusion can be drawn in comparing

EXHIBIT 3-5

CONVENTIONAL FINANCIAL STATEMENTS OF TWO COMPANIES

CONVENTIONAL BALANCE SHEETS

	COMPANY X	COMPANY Y
Current Assets	$12,810,370	$12,855,440
Machinery	4,842,000	16,200,000
Total Assets	$17,652,370	$29,055,440
Liabilities	$ 4,152,370	$15,555,440
Owners' Equity	13,500,000	13,500,000
Total Equities	$17,652,370	$29,055,440

CONVENTIONAL INCOME STATEMENTS

	COMPANY X	COMPANY Y
Net Sales	$34,123,000	$34,123,000
Expenses:		
Compensation	11,125,000	8,760,000
Interest (10% on liabilities)	415,300	1,555,500
Depreciation (9-year useful life)	538,000	1,800,000
Others	19,406,900	19,369,700
Total Expenses	$31,485,200	$31,485,200
Income Before Tax	$ 2,637,800	$ 2,637,800
Income Tax	1,318,900	1,318,900
Net Income	$ 1,318,900	$ 1,318,900
Conventional Rate of Return	7.47%	4.54%

useful resources and efficiency of operations of these companies because the total resources are understated and the rates of return on the total resources used are misrepresented.

Such a false conclusion can be avoided by utilizing the information given in the supplementary statements prepared in accordance with the proposed model as shown in Exhibit 3-6. On the basis of the supplementary data, the companies become more comparable regarding their total resources. Furthermore, the supplementary statements permit the computation of the aggregate rates of return for these companies that are more comprehensive and reliable than the conventional rates of return because they reflect the effective utilization of tangible, as well as human resources.

From the supplementary data, therefore, a conclusion can be drawn that both companies enjoy the same degree of efficiency because both (a) utilize the same amount of tangible and human resources, but in different proportion and (b) produce the same earnings and aggregate rate of return. Company Y uses more tangible assets and accordingly pays lower compensation, but incurs greater depreciation and interest expenses for utilizing and funding the purchase of the additional equipment. Company X, on the other hand, incurs a higher annual compensation but lower expenses for equipment.

EXHIBIT 3-6

SUPPLEMENTARY FINANCIAL STATEMENTS OF TWO COMPANIES

BALANCE SHEETS

	COMPANY X	COMPANY Y
Current Assets	$12,810,370	$12,855,440
Machinery	4,842,000	16,200,000
Human Resources:		
*Discount value of 5-year adjusted compensation	53,640,630	42,237,480
Total Resources	$71,293,000	$71,292,920
Liabilities not related to human resources	$ 4,152,370	$15,555,440
Liabilities related to human resources	52,666,300	41,470,280
Owners' Equity not related to human resources	13,500,000	13,500,000
Owners' Equity related to human resources	974,330	767,200
Total Equity	$71,293,000	$71,292,920

INCOME STATEMENTS

Net Sales	$34,123,000	$34,123,000
Expenses:		
Compensation	11,125,000	8,760,000
Interest (10%)	415,300	1,555,500
Depreciation	538,000	1,800,000
Others	19,406,900	19,369,700
Total Expenses	$31,485,200	$31,485,200
Income Before Tax	$ 2,637,800	$ 2,637,800
Income Tax	1,318,900	1,318,900
Net Income	$ 1,318,900	$ 1,318,900
Aggregate Rate of Return	1.85%	1.85%

*For simplicity, costs of recruiting, training, and developing employees of these companies were assumed to be immaterial and were not reported in the supplementary financial statements.

In short, the additional information, along with the enhanced comparability provided by the supplementary set of statements can assist the users of the financial statements in a better analyses of companies financial positions and operations.

The supplementary financial statements also provide useful information about the employees' compensation not normally reported in the conventional financial statements. In conventional financial statements, such information is usually buried among other expenses and cannot be used by statement users for the purpose of analysis. Management is not normally willing to report the total annual compensation because of the possible danger of its misuse by competitors. However, if the proposed model is used, information about the adjusted 5-year compensation of employees can be provided with less danger of possible misuse.

Closely allied to the function of analysis is that of prediction. The application of the proposed model can also provide for further analysis and prediction some useful information to both internal and external users of financial statements. For instance, an analysis of variation of the aggregate rate of return could highlight the following situations:

1. A lack of proper balance between existing human and non-human resources.

2. An excess or an inadequate increase in employees' annual compensation.
3. An increase or a decrease in the efficiency of the firm's human resources.
4. A favorable or an unfavorable influence of general economic conditions on the firm's operations.

The observation and the analysis of a decline in the trend of the aggregate rate of return, therefore, could assist investors and creditors in predicting success of the organization and could help management in pinpointing and investigating the possible causes. A modest example of such a case is shown in Exhibit 3-7, where the aggregate rate of return has increased from 1.843% for 1971 to 1.948% for 1972 and then has declined to 1.917% for 1973. These variations in the aggregate rate of return could represent all or some of the previously mentioned four possible situations. However, investigation of the available data would reveal the following circumstances:

	1971	1972	1973
Net increase in current assets	$1,865,653	$3,598,274	$1,903,093
Net increase in plant & equipment	1,661,022	28,564	128,284
Net increase in explicit investment in hiring, training of employees	619,070	218,686	184,293
Net increase in compensation of employees	1,750,000	669,000	1,629,000
Aggregate rate of return	1.843%	1.948%	1.917%

EXHIBIT 3-7

COMPARATIVE HUMAN RESOURCE STATEMENTS

BALANCE SHEET

ASSETS:	1971	1972	1973
Total Current Assets	$12,810,346	$16,408,620	$18,311,713
Net Property, Plant and Equipment	3,343,379	3,371,943	3,500,227
Excess of Purchase Price Over Net Assets Acquired	1,291,079	1,288,454	1,285,829
Net Investments in Human Resources: Unexpired Costs of Hiring, Training, and Developing Employees	1,561,264	1,779,950	1,964,243
Discount Value of 5-year Adjusted Compensation	53,647,760	56,759,071	64,637,253
Other Assets	209,419	232,264	213,500
Diferred Financing Costs	--	183,152	173,278
Total Resources	$72,863,247	$80,023,454	$90,086,043
EQUITIES:			
Total Current Liabilities	$ 3,060,576	$ 3,218,204	$ 3,909,083
Long Term Debt, Excluding Current Installments	5,095,000	7,285,000	6,970,000
Deferred Compensation	95,252	116,533	143,150
Liabilities Related to Discounted Compensation	52,676,875	55,674,527	63,421,460
Deferred Income Tax Based Upon Full Deduction for Human Resource Costs	780,632	889,975	982,122
Capital Stock	1,209,301	1,818,780	1,902,347
Additional Capital in Excess of Par	5,645,224	5,047,480	5,676,549
Retained Earnings:			
Financial	2,548,870	3,998,436	4,883,418
Human Resources:			
Related to costs of hiring, training, and developing employees	780,632	889,975	982,122
Related to discounted compens.	970,885	1,084,544	1,215,792
Total Equities	$72,863,247	$80,023,454	$90,086,043

EXHIBIT 3-7 (Continued)

INCOME STATEMENT

	1971	1972	1973
Net Sales	$34,123,202	$39,162,301	$43,161,564
Cost of Sales	21,918,942	25,667,737	28,621,050
Gross Profit	$12,204,260	$13,494,564	$14,540,514
Selling, General and Adm. Exp.	9,417,933	10,190,773	10,783,922
Operating Income	$ 2,786,327	$ 3,303,791	$ 3,756,592
Other Deductions, net	383,174	549,225	598,846
Income Before Tax	$ 2,403,153	$ 2,754,566	$ 3,157,746
Net Increase in Human Resource Investments (recruiting, training, etc.)	137,700	218,686	184,293
Adjusted Income Before Tax	$ 2,540,853	$ 2,973,252	$ 3,342,039
Income Tax	1,197,850	1,414,343	1,615,147
Net Income (Human resource)	$ 1,343,003	$ 1,558,909	$ 1,726,892
Aggregate Rate of Return	1.843%	1.948%	1.917%

*Last year's investments in recruiting, training, and developing employees were expensed immediately in the conventional financial statements. When capitalized as in the human resource statements, these outlay costs would reduce the period expenses and increase the period income reported in the conventional income statement.

These data imply a better balance in 1972 between human and non-human resources. In 1971, much of the investment was directed toward plant, equipment and training employees; current assets, however, apparently were out of balance. In 1972, a better balance was kept among current assets, plant, equipment, and investment in training human resources. The increase in employees' compensation was also in line with the aforementioned circumstances. These reciprocating changes in various resources of the firm improved the aggregate rate of return from 1.843 to 1.948%.

In contrast, during 1973, employees' compensation increased significantly but current assets did not increase accordingly. This situation probably created an undesirable balance between human and non-human resources and reduced the aggregate rate of return. However, the final conclusion cannot be reached here without further insight into and information about the company's operations and the general economic factors during 1973. The management of the company can enhance the utility of the aggregate rate of return by providing additional supplementary and complementary sets of information.

In short, the analysis of the aggregate rate of return, along with other pertinent information, could assist external users of the financial statement to predict success of the organization and also could aid management in seeking answers to the following questions:

1. Was a proper balance kept between human and non-human resources?

2. Were adequate investments made in recruiting, training, and developing human resources?

3. Were changes in employees' compensation reasonable or excessive?

4. Did the company utilize its total human and non-human resources efficiently in comparison with competing firms?

Some Theoretical Support for the Proposed Model

The proposed model can raise such questions in the mind of a reader as (a) does a firm possess the present and the potential services of its employees and thus should the implicit purchasing price of employees' potential services be reported, along with the financial statements, (b) is the suggested aggregate rate of return an appropriate measure, and (c) is employees' compensation a pertinent and reliable medium for measuring a firm's human resources. The remainder of this chapter is devoted to these questions.

Inclusion of Employees' Implicit Purhcasing Price

The problem of viewing, recording, and reporting potential services of employees as assets has been discussed widely by various authors. At one extreme, some writers contend that employees and their services are assets of business organizations and should be treated accordingly.[1] These individuals usually support their views by utilizing the economic definition of "asset" and by quoting from

well-known accountants like Sprague and Vatter. According to Sprague, for example, "asset is a store of services to be received."[2] To Vatter,

> Assets are embodiments of future want satisfaction in the form of service potentials that may be transferred, exchanged, or stored against future events. . . . Assets are service potentials, not physical things, legal rights, or money claims.[3]

The Committee on Concepts and Standards Underlying Corporate Financial Statements of the American Accounting Association also defined assets as: "economic resources devoted to business purposes within a specific entity, they are aggregate of services . . . potentials available for or beneficial to expected operations."[4]

At the other extreme, some accountants reject the idea that employees and their potential services are assets of business organizations by saying that employees' potential services, under normal condition, are not legally owned by the employing firms. To them, "Assets represent expected future economic benefits, rights to which have been acquired by the enterprise as a result of some current or past transaction."[5]

Professor Hermanson has attempted to reconcile these opposing views by suggesting a new classification of assets that differs from the conventional classification and encompasses both definitions of assets. In other words, he has suggested that resources of a business organization be recorded and reported under two separate categories,

"owned assets" and "operational assets." The first category would include "all scarce resources, legally or constructively owned by the entity, and have a separate determinable market value and therefore could conceivably be directly used or converted for the payment of its debts."[6] The second category would, then, accommodate "all scarce resources operating in the entity that are not owned."[7]

A similar treatment has been recommended by others. According to this recommendation, assets may be presented in the balance sheet under three separate classifications. The first classification could include assets both owned and used by a business organization, such as land, building, plant, and equipment. The second classification could include assets owned but not used by a business organization, such as land kept for future use. The third classification could include assets used but not legally owned by a business organization, such as leasehold improvement, long-term leases, and human resources.

Appropriateness of the Aggregate Rate of Return

The foregoing aggregate rate of return "a" may be criticized on the ground of its generality, because it may not be the same for investment for each employee. This criticism is, in fact, valid. The rate of return on investment in an experienced and knowledgeable executive is not the same as the rate of return on investment in a

blue-collar worker. However, because this model does not try to determine a monetary measure of a firm's human resources on an individual employee basis, this criticism becomes irrelevant.

The aggregate rate of return also may be criticized on the basis that it represents a rate of return on physical and human resources combined. In other words, the rates of return on investment in these resources may not be the same. This criticism, although convincing, is not valid because physical assets by themselves normally are not capable of producing earnings. Some human factors are always involved in the utilization of physical assets. Stated differently, physical assets and human resources are necessarily concomitant factors; and, hence, meaningful rate of return cannot be determined on investment in these assets on an individual basis. Therefore, the aggregate rate of return "a", which represents return on all resources employed, is a suitable and useful rate for the proposed model.

The aggregate rate of return may also be criticized because it represents a rate of return for only one year. Consequently, the year selected for computation may not represent a normal year for the operations of the firm. This weakness, indeed, may be removed by the use of a weighted average of several past years' rates of return, as Professor Hermanson suggested for his model.

Because the book value of physical assets is not a

good representation of the current costs of assets, the current cost may be used in this model. This practice should improve the outcomes of the model.

Compensation as a Medium for Measuring Human Resources

The measurement model presented in the preceding section was premised on the assumption that employees' compensation is a reliable and readily available index for measuring cost and efficiency of a firm's human resources. The question may be raised concerning the validity of such an assumption in a real situation. Several studies, as will be discussed later, have proved the relative validity of such an assumption. However, no evidence is yet available to indicate a perfect correlation between employees' compensation and fair value of employees' services in all situations. The remainder of this section is devoted to a review of some evidence regarding that assumption.

Some Theories and Empirical Studies Related to Compensation:

The question of the fairness, and the motivational effects of pay on employees' behavior has been discussed by various philosophers, economists, and social psychologists for many years. As a result, a number of theories are available. The following theories are pertinent to the proposed model.

1. Exchange
2. Distributive Justice
3. Social Comparison
4. Equitable Payment

Theory of Exchange. According to this theory, compensation reflects a transaction between man and organization, in which the organization attempts to obtain the highest quality and quantity of service for the compensation paid and the employee seeks the highest possible compensation for his services.[8] Consequently, the agreed compensation is conceived as a fair price for employees' services by both sides of the transaction. Otherwise, the employment transaction, either will not be consummated or, if consummated, will not be perpetuated.

Theory of Distributive Justice. According to this theory, "a man in an exchange relation with another will expect that the rewards of each man be proportional to his costs--the greater the rewards, the greater costs--and that the net rewards or profits of each man be proportional to his investments."[9] Consequently, if either side to the exchange perceives a disproportionality between his rewards and investments, he will either seek to reduce and remove the disproportionality through various behavior or change his perception of the situation.[10] This logic is believed to govern employment contract in the sense that, if either an employer or an employee does not perceive a balance between his rewards and investments, the employment probably will not last long.

Theory of Social Comparison. This theory presented by Patchen indicates that an employment contract is usually consummated and perpetuated when a balance between the following is perceived.[11]

$$\frac{\text{My Pay}}{\text{His (Their) Pay}} \text{ Compared to } \frac{\text{My Position or Dimensions Related to Pay}}{\text{His (Their) Position or Dimensions Related to Pay}}$$

In other words, "how a person feels about his pay depends not only on its absolute size, but on how it stacks up against those of other people with whom he compares himself."[12] Consequently, if an individual perceives a disproportionality between his pay and those of others with whom he compares, he will take action to remove that inequality and to regain an equality.

Several studies have demonstrated the relative validity of the Patchen Social Comparison Theory. For instance, a study of 228 managers in five San Francisco area firms revealed that managers made some internal and external comparison regarding their pay. As Table 3-1 suggests, the external comparison appears to be significant among all groups of managers. In addition, the study revealed that "the greater the man's education, the more likely he was (1) to compare his pay with persons outside the company and (2) not to compare himself with his peer within the company."[13]

TABLE 3-1

CHOICE OF REFERENCE AS A FUNCTION OF MGT. LEVEL

	Choice of Reference Group				
	Within Company			Outside Company	
	Higher Level	Same Level	Lower Level	All Outside Choices	N
Middle Management	12%	12%	41%	35%	17
Lower-Middle Mgt.	17	20	10	53	70
Lower Management	16	34	15	35	134

Source: I. R. Andrews and M. M. Henry, "Management Attitudes Toward Pay," Industrial Relations, Vol. 3, 1963, 64, p. 31.

Theory of Equitable Payment. This theory first presented by Elliott Joquies,[14] postulates that "individuals have an intuitive knowledge of their capacity, the level of their work, and the propriety of their pay, and when their capacity is properly utilized in their work and when their pay matches their level of work, they achieve psychological equilibrium."[15] On the basis of this theory, therefore, individuals would perceive inequity and possibly would react to it if their pay is not reasonably comparable with the level of their work.[16]

J. S. Adams states this theory in a comparative sense. According to him, every man expects a certain relationship between his inputs and outcomes and others inputs and outcomes. Thus, when an individual compares himself

with another person, he looks at his own inputs and outcomes in relation to those of the other person. In this sense, if two individuals receive either different pay while being equally qualified, or the same pay, but are unequally qualified, both pairs may suffer from cognitive dissonance, even the man who is relatively overpaid.[17] This theory, in short, suggests that equitable payment occurs when:[18]

$$\frac{\text{Outcomes for Person}}{\text{Inputs for Person}} = \frac{\text{Outcomes for Other}}{\text{Input for Other}}$$

Several empirical studies support the relative validity of this theory. For instance, in one study, 96 students were paid one of three rates (equitable pay, underpay, and over pay) for a certain kind of work. The result of this study indicated "that underpaid students maintained equity by increasing work quantity at the expense of work quality, whereas overpaid students maintained equity by reducing quantity and increasing quality."[19]

Another study provided further support for the Adams Equity theory. In this study likewise, subjects were paid with either an equitable wage or an unfair low wage for doing an interviewing job. This study indicated that "although underpaid subjects produced more interviews than equitably paid subjects, the interviews were of lower quality."[20]

In another study, 31 workers were hired for a clerical work on an hourly basis. They were then divided

into three groups, with each receiving either an overpay, underpay, or fair pay. Despite the previously mentioned studies and the equity theory, no significant difference among the groups' performances was observed. However, 3 of the 11 underpaid workers quit the job, compared with none in other groups. As a result of this observation, the researcher concluded that "inequity effects previously reported are probably due mainly to the self-esteem variable."[21] He then suggested that "research on wage inequity should focus more on variables such as turnover, satisfaction, and recruitment, rather than solely on work performance."[22]

Impact of Pay on Employee Turnover. Many studies investigated empirically the relationship between pay and turnover. For instance, in the F. J. Minor study differential between salary expected and salary received was revealed to be a good predictor of turnover among the 32 examined variables.[23] A factory study by B. L. Poidevin also showed a significant relationship between pay and turnover. According to this study "there was a direct relationship between pay rates and labor turnover rates of the different sections-the higher paid groups having lower turnover rates and vice versa."[24]

The importance of pay as a cause for job grievances and for job quitting was manifested in the Smith and Kerr study in which the employees mentioned pay twice as often as any other reason.[25] The role of pay as the most important

determinant of turnover was also revealed in a study by Stockford and Kunze. In their study, they found "that of the 12 factors, those having to do with economic aspects, appeared to contribute most to an employee inclination to remain with or leave the organization."[26]

In the employee-exit interviews during 1960-64 for a manufacturing concern employing almost 5,000, W. W. Ronan arrived at the following reasons (shown in Table 3-2) for the labor turnover.

As can be seen, salary (wages) as the major reason was mentioned first by 39 of 66 total terminators among office and clerical and the administrative and professional personnel.

These studies indicate the relative importance of pay in hiring and retaining employees. However, many other non-monetary factors undoubtedly induce individuals occasionally to accept and retain a lower-pay position including opportunity for advancement, working conditions, interesting work, supervisor-employee relation, adequacy of communication, relationship with workers, and work load.[27] However, usually "when pay differences reach major proportion, other factors begin to fade in importance"[28] and the low pay will force an individual to look for a job with a higher pay.

In short, in a free economy, pay appears to be a readily available index that approximates sufficiently a

TABLE 3-2

REASONS FOR TERMINATING EMPLOYMENT FIRST MENTIONS

Reasons Given	Shop Workers	Office & Clerical		Administrative and Professional	Total Persons
		M	F		
1. Recognition	-	1	-	2	3
2. Achievement	1	-	1	3	5
3. Growth Possibility	3	1	-	3	7
4. Advancement	2	-	-	1	3
5. Salary (Wages)	-	8	6	25	39
6. Interpersonal Relations:					
A. Superior			2	1	3
B. Peers	-	-	-	-	-
7. Supervision-Technical	-	1	1	1	3
8. Company Policy & Adm.	-	-	1	1	2
9. Work Conditions	3	-	-	2	5
10. Work Itself	1	-	1	1	3
11. Personal	1	-	2	1	4
12. Job Security	13	-	-	-	13
13. No Reason	1	-	-	-	1

Source: W. W. Ronon, "A Study of Some Concepts Concerning Labor Turnover," Occupational Psychology, Vol. 41, No. 4 (1967), p. 194.

fair price for employees' services. Therefore, pay may be used to estimate a firm's human resources.

Relationship between Pay and the Organizational Success. Unfortunately, there are not many empirical studies regarding the relationships between the success of a business organization and the compensation of its employees. However, two important studies, at least, imply some correlation between managerial pay and corporate performance.

In the first study the cross-sectional relationship between executive compensation and company performance at three-year intervals, beginning in 1942 and ending in 1963 was examined by Wilbur, Lewellen, and Huntsman.[29] The sample examined in this study consisted of 50 firms drawn from the top of the Fortune magazine list of the nation's 500 largest companies. The findings of this study provided "strong support for the hypothesis that top management's remuneration is heavily dependent upon the generation of profits."[30] This study, however, did not provide a strong support for the correlation between executive compensation and company level of sales.

In the second study also the relationships between (a) executive income of 45 of the largest 100 industrial corporation in the United States and (b) the sales and profits of these companies were examined. The evidence presented in that study "seems to support the likelihood that there is a valid relationship between sales and

executive income."[31] However, the study did not suggest a close relationship between profits and executive incomes, because of statistical problems involved.

Findings of those studies, though not adequate to support a general conclusion, at least imply some correlation between company performance and executive pay. If such a correlation exists between performance of a company and compensation of all its employees, then compensation is a useful and reliable medium for measuring a firm's human resources.

Summary

In this chapter a model for preparing a monetary measure for a firm's human resources was proposed. This model, in contrast to the acquisition cost model, utilizes not only the unexpired costs of investments in employees' recruiting, training, and developing, but also an estimated "implicit purchasing price of employees' potential services." This monetary measure of human resources, when reported by companies as a supplement to their financial statements, is anticipated to bring companies in a more comparable sition.

Such supplementary data also have potential for assisting external and internal users of accounting information in analyzing better a company's financial position and operations, in addition to the changes in (a) employees' level of compensation, (b) balance between human and

non-human resources, and (c) investments in such accounts as employees' training and development.

In utilizing the concept of the present value of employees' compensation, the proposed model uses input data that are more readily available and less subjective than those required by other models. For instance, the Hermanson model uses an arbitrary rate of discount and such a broadly based statistic as "the average rate of accounting income on owned assets for all firms in the economy." The Frantzerb, Landau, and Lundberg model, likewise, requires information concerning the productivity of employees. which normally cannot be determined objectively. The Lev and Schwartz model, like the preceding two models, utilizes a discount rate which is arbitrarily calculated.

Unlike the other models, the proposed model utilizes a discount rate and a productivity factor of employees, which are determined through a set of equations, with less opportunity for interjecting personal bias. Hence, the outcome of the proposed model can be expected to be less subjective and questionable.

The proposed model is also more applicable and economical than some of the other models. In other words, the application of the model is not expensive (provided information about the accumulated costs of recruiting, training, and developing employees are readily available) because the data concerning the annual earnings of the

firm and the employees' compensation are readily available in the company records.

Nonetheless, the proposed model is not perfect and ideal. Its shortcomings include the time span for which employees' compensation need to be discounted and the accumulated costs of recruiting, training, and developing employees should be amortized. However, at the present stage of the art, the proposed model appears to be more practical, objective, and useful than some of the existing models.

FOOTNOTES

[1]Allen A. Cooper and James E. Parker, "Human Resource Accounting: An Examination," Cost and Management, Vol. 47, No. 1 (January and February 1973), p. 23. Mervyn W. Wingfield, "Another Look at Human-Resource Accounting," The Virginia Accountant, Vol. 23 (September 1971), p. 9.

[2]Robert T. Sprouse and Maurice Moonitz, A Tentative Set of Broad Accounting Principles for Business Enterprise, AICPA, p. 19.

[3]W. J. Vatter, The Fund Theory of Accounting and Its Implications for Financial Reports (The University of Chicago Press, 1947), p. 19.

[4]"Accounting and Reporting Standard for Corporate Financial Statements," AAA 1957 Revision, The Accounting Review, Vol. XXXII, No. 4 (October 1957), p. 538.

[5]Sprouse and Moonitz, A Tentative Set of Broad Accounting Principles for Business Enterprise, p. 20.

[6]Roger Hermanson, "Accounting for Human Assets," Occasional paper No. 14, Bureau of Business and Economic Research, Graduate School of Business Administration, Michigan State University, East Lansing, 1964, p. 8.

[7]Ibid., p. 8.

[8]David W. Belcher, Compensation Administration (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1974), p. 3.

[9]G. C. Homans, Social Behavior: Its Elementary Forms (New York: Harcourt, Brace and World, 1961), Cited from Fair Pay and Work, Roy Richardson (Carbondale and Edwardsville: Southern Illinois University Press, 1971), p. 10.

[10]Ibid., p. 10.

[11]Ibid., p. 10.

[12]I. R. Andrews and Mildred M. Henry, "Management Attitudes toward Pay," Industrial Relations, Vol. 3 (1963-64), p. 30.

[13]Ibid., p. 31.

[14]Elliott Jaques, Equitable Payment (New York: John Wiley and Son, Inc.), 1961.

[15]Belcher, Compensation Administration, p. 52.

[16]Ibid., p. 52.

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[20]Edward E. Lawler, III, and Paul W. O'Gara, "Effects of Inequity Produced by Underpayment on Work Output, Work Quality, and Attitudes toward the Work," Journal of Applied Psychology, Vol. 51, No. 5 (1967), p. 409.

[21]E. R. Valenzi and I. R. Andrews, "Effect of Hourly Overpay and Underpay Inequity when Tested with a New Induction Procedure," Journal of Applied Psychology, Vol. 30, No. 1 (1971), p. 22.

[22]Ibid., p. 22.

[23]F. J. Minor, "The Prediction of Turnover of Clerical Employees," Personnel Psychology, Vol. 11, No. 3 (Autumn, 1958), p. 397.

[24]B. L. Poidevin, "A Study of Factors Influencing Labor Turnover," Personnel Practice Bulletin, Vol. 12 (1956), pp. 11-18, Cited from W. W. Ronan, "A Study of and some Concepts Concerning Labor Turnover," Occupational Psychology, Vol. 41, No. 4 (1967), p. 198.

[25]F. J. Smith and W. A. Kerr, "Turnover Factors as Assessed by the Exit Interview," Journal of Applied Psychology, Vol. 37, No. 5 (1953), p. 354.

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[27]David I. Sheppard, "Relationship of Job Satisfaction to Situational and Personal Characteristics of Terminating Employees," Personnel Journal, Vol. 64, No. 9 (October 1967), p. 568.

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[29]Wilbur G. Lewellen and Blaine Huntsman, "Managerial Pay and Corporate Performance," The American Economic Review, Vol. 60, No. 4 (1970), p. 710.

[30]Ibid., p. 716.

[31]Joseph W. McGuire, John S. Y. Chiu, and Alvar O. Elbing, "Executive Income, Sales and Profits," The American Economic Review, Vol. 52 (1962), p. 760.

CHAPTER IV

RESEARCH METHODOLOGY

One of the objectives of this study was to acquire empirical evidence concerning the usefulness of monetary measures of a firm's human resources to the external users of financial statements, especially investors. The research methodology utilized in such an investigation is discussed in this chapter that presents the design and testing of the questionnaire, the sampling procedures and design, the pattern and rate of responses, and the methods of data analysis.

Design of the Questionnaire

In designing the questionnaire, the investigator gave considerable thought to the comprehensiveness and the length of the questionnaire. As a result, fifteen questions were prepared for the questionnaire concerning the five research questions stated in Chapter I. In addition, three sets of financial statements, prepared on the basis of the following assumption and principles were presented in the first part of the questionnaire (Appendix A).

The first set of the financial statements was prepared on the basis of conventional accounting principles. Therefore, all the cash outlays relating to recruiting, training,

and developing employees were treated as current expenses. The second set of the financial statements was prepared on the assumption that a part of currently incurred costs of recruiting, training, and developing employees could benefit future operating periods. Thus, such outlay costs were first capitalized, and then gradually amortized according to the "matching principle". In short, unexpired costs of recruiting, training, and developing employees were included in set 2 to present a monetary measure of a firm's human resources. The third set of the financial statements was prepared on the assumption that employees' compensation is a reliable and readily available index and represents a major part of the value and costs of a firm's human resources. Based on this assumption, set 3 included the discount value of adjusted five-year salaries, wages, and fringe benefits of all employees, in addition to the unexpired costs of recruiting, training, and developing employees, as a monetary measure of a firm's human resources.

To eliminate any personal bias, opinion, and artificiality in the preparation of these three sets of financial statements, the figures appearing on the financial and human asset statements of R. G. Barry Corporation for 1971 were used. Also, to avoid any bias of the outcomes, no indication of the assumed usefulness and application of either model, in making investment decisions, was given in the questionnaire. Any possible application of the monetary measures

of human resources was left to the capability and the enthusiasm of the respondents.

Of the fifteen questions presented in the second section, the first six were concerned with the usefulness of human resource information provided in the financial statements sets 2 and 3. The intent of the six questions was to determine which set of the financial statements the respondents would prefer in making investment decisions, why they would prefer a particular set of statements, and how they would prefer that human resource information provided in sets 2 and 3 be reported. Question seven was related to the degree of the familiarity of the respondents with human resource accounting. Questions eight through twelve and question fifteen were designed to obtain information about the background, the occupation, the education, and the age of the respondents. In question thirteen, the opinion of the respondents was solicited regarding the usefulness and the reliability of the conventional financial statements. This question was included as a control device, because, if a respondent did not rely upon and use the conventional financial statements in his investment decisions, he would normally be indifferent about including human resource information in the financial statements. In question fourteen, the respondents were asked whether they thought that information about human resources would be reported with the published financial statements by most companies in the next five to ten years.

At the end of the questionnaire, an open-end question was added to solicit: (a) any additional information that the respondents would like to have presented in sets 2 and 3 of the financial statements and (b) the kinds of problems evidenced by the respondents regarding the use of statements set 2 and/or 3.

Testing of the Questionnaire

A preliminary test, consisting of two stages, was conducted to test the relevancy, adequacy, and clarity of the questionnaire. In the first stage, copies of a preliminary questionnaire were distributed to 15 graduate accounting students at the University of Oklahoma. These students were asked to complete the questionnaire and to comment on the length, content, and structure of the questionnaire. Upon receipt of the responses, the questionnaire was revised. The shorter two-page questionnaire was then evaluated in personal interviews in Oklahoma City, Oklahoma, with nine CPAs in various CPA firms and two financial analysts employed by a savings and loan association and investment firm. These individuals were asked to review and complete the questionnaire. Their opinions were also solicited regarding the length of the questionnaire and the relevancy, comprehensiveness, and clarity of the questions.

Based on the suggestions received from these individuals and after consulting with the dissertation committee, the researcher developed the final questionnaire that was

sent to a sample of managers, certified public accountants (CPAs), chartered financial analysts (CFAs), trust and financial officers of banks and trust companies (TOs), and accounting, finance, and management students (STs) at the University of Oklahoma.

Sampling Procedures

The following factors were deemed important in selecting the sample, (a) the definition of the population, (b) the size of the sample, and (c) the design of the sample.

Definition of the Population

The goal of this study was to reach a population that prepares and uses financial statements in making investment decisions. This population logically consists of managers, public accountants, and financial analysts. This view is supported by John C. Burton, a recognized author who stated:

> Because of its importance in appraising success and making decisions, corporate financial reporting is an important interest of many professional groups in our economic society. Managers charged with the responsibility of reporting the results of their firm's economic activities clearly have a primary concern. So do public accountants who must review these financial reports and attest to their fairness of presentation. Finally those who use this information in decision-making of various sorts are also vitally interested in its form and content. Among such groups the financial analysts who must make investment decisions and guide the decisions of others in the economy have an obvious interest.[1] (emphasis added)

Financial and trust officers of bank and trust companies also make extensive use of financial statements. According to the Wall Street Journal,

> Bank trust departments currently manage a staggering $378 billion for an estimated 30 million individuals, either directly under wills and other agreements or indirectly through pension and profit-sharing plans. By contrast, mutual funds manage just $36.4 billion, less than 10% of the trust department total...The very size of their holding has made trust departments the subject of increasing attention of late, much of it critical. Some observers decry the potential economic power the trusts possess because of the large interests they control in many major corporations.[2]

Because of the important role of managers, public accountants, financial analysts, and financial officers of trust companies in preparing and/or utilizing financial statements in making investment decisions, the sample utilized in this study included a number of these individuals. However, to acquire opinions of potential investors who do not belong to any of these groups, a number of students also were included in the sample. Such a sample, therefore, was expected to represent those individuals who were interested in and were knowledgeable about financial statements.

Sample Size

In determining the size of the sample consideration was given to the cost of the sampling and the desired reliability of the sample by reviewing the previous studies regarding human resource accounting and by using them as a frame of reference. In one such study, Nabil Elias, an Associate Professor at the University of Manitoba, used a sample consisting of 100 certified public accountants, 64 chartered financial analysts, 100 financial analysts, and 102 students.[3] In another study of human resource accounting

by William G. Shenkir, John B. Sperry, and Robert H. Strawser the researchers sent out questionnaires to a sample of 200 controllers and to partners in the "8 big" CPA firms.[4]

On the basis of these observations and the desired balance between the reliability and the sample cost, a sample of 452 individuals was considered reasonable for this study. This ample was distributed as follows: 100 controllers, 100 certified public accountants, 100 chartered financial analysts, 21 managers of the R. G. Barry Corporation, 100 trust or financial officers of banks and trust companies, and 31 students.

Sample Design

The first group in this sample was 100 controllers of large corporations whose names were selected by the use of a table of random numbers from the list of the Fortune 500 largest United States industrial corporations. Controllers were included in the sample because they are normally responsible for reporting the results of the operations to the external users of financial statements, including stockholders. Consequently, in any monetary measure of a firm's human resources, the understanding, agreement, and support of managers and controllers are important elements.

In addition to the corporation controllers, 21 executives and managers of the R. G. Barry Corporation, whose

names appeared on the 1973 annual report of the firm, were also included in the sample. These individuals were included in the first group, because of their practical experience in a system of human resource accounting. Their opinions, therefore, could be valuable when contrasted with those without practical experience in human resource accounting.

The second group of individuals included in the sample was 100 certified public accountants. These individuals were selected randomly from the 1974 AICPA Membership Directory, and were included in the sample, because they were assumed to be well informed and knowledgeable about financial reporting and practices.

The third group consisted of 100 certified financial analysts selected randomly from The Financial Analysts Federation, 1974 Membership Directory. The fourth group of the sample included 100 randomly selected financial and trust officers of banks and trust companies listed in the Fall, 1973, American Banks Directory. Groups three and four in the sample represented individuals who used published financial statements extensively in making investment decisions. Thus their opinions could be invaluable regarding this research topic.

The fifth group in the sample was comprised of 31

students, of whom 14 were accounting majors, 15 finance majors, and 2 management majors.

Pattern of Survey Responses

On February 25, 1975, a questionnaire, an explanatory letter, a covering letter, and a return envelope were mailed to selected 421 individuals in the sample. An overall response rate of 30 percent was obtained within 23 days. A follow-up copy of the questionnaire, along with the explanatory letter and a new covering letter, was mailed to the non-respondents. Within three weeks, 16 percent additional responses were received, raising the overall response rate to 46 percent.

However, 8 of the first questionnaire mailing and 3 from the second were returned undelivered. Furthermore, 4 persons did not participate in the research, and one questionnaire was completed partially. Thus, these non-respondents reduced the rate of usable responses to 43.9 percent. Table 4-1 shows the pattern and the rate of responses.

Methods of Data Analysis

The descriptive analyses of the data included the frequency distributions, percentages, ranks, means, and standard deviations. For testing the hypotheses, several additional statistical tools (including analysis of variance, F ratio test, Chi-square test, contingency coefficient, the Kruskal-Wallis test, and Wilcoxon Signed-Ranks test) were

TABLE 4-1

RATE OF RESPONSES FOR NON-STUDENT

Group	No. of Questionnaires Mailed	Total Response Received	Overall Rate %	Usable Responses	Response Rate on Usable Responses %
R.G. Barry Mgt.	21	7	33	7	33.0
Controllers	100	52	52	49	50.5
CPAs	100	45	45	41	42.7
CFAs	100	41	41	34	36.5
Trust Officers	100	49	49	47	47.9
Total	421	194	46	178	43.9

considered. Nonetheless, among them, the Chi-square test, contingency coefficient, analysis of variance, and F ratio test appeared to be more suitable for the data of this study.

The Chi-square test and contingency coefficient were preferred mainly for two reasons. First, these statistical tools can be applied, regardless of the type and the shape of the population.[5] Second, the variables need not be continuous. However, because of the risk of losing some information because of the required collapsing of the data for using the Chi-square test, the analysis of variance and F ratio test were also employed. For this purpose, the five-point ordinal scale used in the questionnaire was converted to a numerical five-point scale, with number 1, 2, 3, 4, and 5 assigned to

the words "none," "little," "somewhat," "much," and "very much," respectively. This five-point numerical scale was also used for computing the mean and the standard deviation for each group.

This practice is apt to be unfavorably criticized because of the arbitrary assignment of numerical values to the ordinal scale. However, according to Sanford Labovitz,

> The utility of assigning numbers or scoring systems to ordinal data and then using intervally-based statistics is supported in several ways. In addition, it is demonstrated that the linear scoring system results in a small amount of error no matter what the "true" scoring system may be.[6]

In testing hypothesis C, the Wilcoxon Signed-Ranks test in addition to the preceding statistical tools was employed. In that test also, the foregoing numerical five-point scale was used. This particular statistical tool was applied mainly because the transformation of the employed five-point ordinal scale to a numerical five-point scale could not affect the outcome of the test. On the contrary, the Kruskal-Wallis test was not used in this study, because the transformation of the discontinuous variables of this study could have compounded the difficulty of interpreting the outcomes.

Summary

In this chapter the research methodology was discussed. Included in the discussion were such topics as the design and testing of the questionnaire, the sampling procedures and

design, the pattern and rate of responses, and the method of data analysis.

The questionnaire included three sets of financial and human resource statements (prepared on the basis of different assumptions and principles) and fifteen questions. This questionnaire was first tested through personal interviews and then sent to a sample of 100 CPAs, 100 CFAs, 100 trust and financial officers, 121 controllers and managers, and 31 students. From these individuals, a total of 178 non-students and 31 students completed and returned usable questionnaires. The rate of response was 43.9 percent for non-students, after eliminating undelivered questionnaires and defective responses from the computation.

The data gathered through the questionnaires were analyzed by utilizing such statistical tools as the mean, the standard deviation, the Chi-square test, the analysis of variance and F ratio test, and the Wilcoxon Signed-Ranks test. The results of the statistical analyses and tests are reported in Chapter V.

FOOTNOTES

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[2]Jonathan R. Laing, "Fiduciary Giants," Wall Street Journal (January 7, 1975), p. 1.

[3]Nabil Elias, "The Impact of Accounting for Human Resources on Decision-Making: An Exploratory Study," Unpublished Dissertation, University of Minnesota, 1970, p. 53.

[4]W. G. Skenkir, J. B. Sperry, and R. H. Strawser, "Human Resource Accounting: A Report on the Progress to Date," Paper presented at the American Institute for Decision Sciences, New Orleans, Louisiana, 1972.

[5]Elias, "The Impact of Accounting," p. 56.

[6]Sanford Labovitz, "Some Observations on Measurement and Statistics," Social Force, Vol. 46, No. 2 (December 1967), p. 151.

[7]Janet T. Spence, Benton J. Underwood, Carl P. Duncan, and John W. Cotton, Elementary Statistics (New York: Appleton-Century-Crofts, 1968), p. 216.

CHAPTER V

STATISTICAL ANALYSIS AND FINDINGS

Introduction

As was stated in Chapter I, one objective of this research was to investigate empirically the usefulness of human resource accounting to the external users of the financial statements. This objective was accomplished through an empirical investigation of the following questions.

1. Is human resource information, provided on the basis of the acquisition cost method (Set 2), useful for making investment decisions by the users of financial statements?

2. Is human resource information, provided on the basis of the discount value method (Set 3), useful for making investment decisions by the users of financial statements?

3. Which of the above methods of measuring human resources is preferred by the users of financial statements?

4. Which of the possible methods of reporting human resources is preferred by the users of financial statements?

5. Will the responses to the above questions differ significantly on the basis of the profession, the education, the background, and the level of the respondents' reliance on the conventional financial statements?

The scope of this chapter, therefore, includes a

brief presentation of the hypotheses, the descriptive statistical data, the statistical test of hypotheses, and the findings. For the purpose of testing statistically the hypotheses, all the hypotheses are presented in a "null" form. Therefore, the acceptance of the null hypotheses "A" and "B" indicates that the human resource information provided in Sets 2 and 3 was not useful in making investment decisions. The acceptance of hypothesis "C" implies that neither of two sets (2 and 3) was more useful than the other. The acceptance of the sub-hypotheses reveals that the degrees of usefulness of Sets 2 and 3 were the same to all users of financial statements, regardless of their profession, education, and background.

Hypothesis A

> Information provided in Set 2 regarding a firm's human resources is not useful to the users of financial statements for making investment decisions.

The empirical information about this hypothesis was gathered through the following question included in the questionnaire:

> If you were considering an investment in the stocks of the ABC Company, how much would the information provided in Set 2, in addition to that given in Set 1, help you to make a better investment decision.

Descriptive Statistical Data

In the forementioned question, the participants were asked to mark one of the five possible answers, ranging from "very much" helpful to "none." Table 5-1 shows the responses of 209 participants.

TABLE 5-1

OPINION OF PARTICIPANTS REGARDING SET 2

Degree of Usefulness	No. of People	% of People	Index Number	Magnitude
None	73	34.9	1	73
Little	58	27.8	2	116
Some	59	28.2	3	177
Much	15	7.2	4	60
Very much	4	1.9	5	20
Total	209	100.0		446

Mean = $\frac{446}{209}$ = 2.134

Standard deviation 1.0383

Of the 209 individual participants, 73 or 34.9 percent reported that the human resources information provided in Set 2 was not helpful for their investment decisions; 58 or 27.8 percent, a little helpful; 59 or 28.2 percent, somewhat helpful; 15 or 7.2 percent, helpful; and 4 or 1.9 percent, very helpful.

To acquire further information about the magnitude

of these five categories of responses and also to compute a mean and other statistics for overall usefulness of the human resource information (Set 2), the applied ordinal scale was converted to the numerical scale by assigning numbers 5 to 1 to answers ranging from "very much" to "none," respectively. The results (products of columns 2 and 4), appear in column 5. The total of this column, divided by the number of participants (209), is equal to 2.134, representing an overall mean for the 209 participants. Because it is above the index value corresponding with answer "little" helpful, then, the human resource information provided in Set 2 may be said to be a little help to the users of financial statements for making investment decisions.

Statistical Tests

In order to apply a Chi-square test, Table 5-1 was rearranged by combining and reporting all the "little" "some", "much" and "very much" responses into one category as shown in Table 5-2.

TABLE 5-2

RESPONSES REGARDING THE USEFULNESS OF SET 2

	Not Useful	Useful	Total Individual
Observed	73	136	209
Expected	104.5	104.5	209

Figure 73 represents the number of participants who indicated that the human resource information given in Set 2 was not helpful for making investment decisions. The figure 136, on the contrary, represents the number of participants who viewed the human resource information in Set 2 as being of "little," "some," "much" or "very much" helpful for making investment decisions. The figure 104.5 represents the expected number of observations in each cell, when an equal probability is assigned to the "usefulness" and "not usefulness" of the human resource information given in Set 2.

The Chi-square for these data is equal to 18.99, which is greater than the table value (3.84) at the 5 percent level of significance. Based on this test, therefore, the null hypothesis was rejected, with the implication that the human resource information given in Set 2 is useful at the 5 percent level of significance.

That conclusion was reached for the entire group of the 209 participants comprised of 41 CPAs, 34 CFAs, 47 trust officers, 56 managers, and 31 students. To evaluate the views of non-student participants, a similar test was conducted after excluding the students. In this case, the null hypothesis was also rejected because the Chi-square of 6.49 was larger than the table value of 3.84 at the 5 percent level of significance.

In short, the conclusion can be drawn that the

human resource information prepared on the basis of the acquisition cost model and presented in Set 2 was useful for making investment decisions. However, the degree of usefulness of such an information was slightly more than "little" on an ordinal five-point scale.

Hypothesis A_1

The degree of usefulness of information provided in Set 2 is the same to all users of financial statements, regardless of the profession of the users.

Descriptive Statistical Data

The data regarding this hypothesis were gathered through questions 1 and 8 of the questionnaire. Table 5-3 shows the frequency distribution for the answers to these two questions. According to this table, 18 or 43.9 percent of the CPAs viewed the human resource information given in Set 2 of no help for making investment decisions. In contrast, 2 or 4.9 percent of the CPAs viewed the information very much useful for making investment decisions. The other columns of Table 5-3 show the opinions of other professions.

Statistical Tests

For all sub-hypotheses, two statistical tests were applied, the analysis of variance (F test) and the Chi-square. For the analysis of variance the data gathered through the application of the ordinal scale were transformed

TABLE 5-3

RELATIONSHIP BETWEEN USEFULNESS OF SET 2 AND PROFESSION OF PARTICIPANTS

Usefulness of Set 2	Profession					Total Persons
	CPAs	CFAs	Trust Officers	Managers	Students	
None	18 43.9%	12 35.3%	12 25.5%	30 53.6%	1 3.2%	73 34.9%
Little	12 29.3%	11 32.4%	16 34.0%	10 17.9%	9 29.0%	58 27.8%
Some	6 14.6¢	10 29.4%	14 29.8%	13 23.2%	16 51.6%	59 28.2%
Much	3 7.3%	1 2.9%	3 6.4%	3 5.4%	5 16.1%	15 7.2%
Very much	2 4.9%	0 0%	2 4.3%	0 0%	0 0%	4 1.9%
Total	41 100%	34 100%	47 100%	56 100%	31 100%	209 100%

by assigning numbers 1 through 5 to the responses ranging from "none" to "very much," respectively. After such a transformation, the mean and standard deviation for each group and the variances and F ratio for the total groups were computed. Table 5-4 shows the results of such an operation for hypothesis A_1.

For the Chi-square test, the data reported in some cells of the frequency distribution tables were collapsed, because these cells had expected values less than five. This condensation was made by combining rows representing "some," "much," and "very much" responses in one row. The Chi-square and the contingency coefficient for the hypothesis A_1 are also given in Table 5-4.

Both the statistical tests suggested the rejection of the null hypothesis at the 5 percent level of significance. This rejection, therefore, implied a significant association between the profession of the user of financial statements and the usefulness of the human resource information given in Set 2.

The above Chi-square test did not reveal the magnitude of the difference of opinion concerning the usefulness of Set 2 between and among the profession. A set of pair comparison Chi-square tests was used for this purpose and the results are shown in Table 5-4. In these tests, students were excluded to reduce the number of the comparisons. The statistically significant differences of opinion appeared (a) between trust officers and managers and (b) between trust

TABLE 5-4

RESULTS OF THE STATISTICAL TESTS
(FOR TABLE 5-3)

ANALYSIS OF VARIANCE

	Profession of the Participants				
	CPAs	CFAs	Trust Officers	Managers	Students
Mean	2.0000	2.0000	2.2979	1.8036	2.8065
Standard Deviation	1.1619	0.8876	1.0615	0.9802	0.7492

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	22.7410	4	5.6852	5.7556
Within Groups	201.5073	204	0.9878	
Total	224.2482	208		

CHI-SQUARE

Chi square	29.9762
Degree of Freedom	8
Chi square/DF	3.7470
Contingency Coefficient	0.3542

PAIR COMPARISON TESTS

Pairs	Chi Square	Contingency Coefficient	Rank
CPAs vs. CFAs	.5739	.0871	1
CPAs vs. Mgt.	.8852	.0951	2
CFAs vs. TOs	.9017	.1049	3
CFAs vs. Mgt.	2.8395	.1749	4
CPAs vs. TOs	3.2889	.1898	5
TOs vs. Mgt.	8.3193	.2734	6

*In all the above cases, the degree of freedom is one.

officers and CPAs. The aggregate of these outcomes and the means of the groups, therefore, shows the opinions of the trust officers to be more favorable than those of managers and CPAs.

Hypothesis A_2

The degree of usefulness of information provided in Set 2 is the same to all users of financial statements, regardless of the level of the education of the users.

Descriptive Statistical Data

The data for this hypothesis were gathered through questions 1, 9, and 11 of the questionnaire. Table 5-5 demonstrates the frequency distribution for the answers to these questions. In this table, responses to questions 9 and 11 were combined and shown in five columns. The first two columns, relating to question 9, present the responses of participants with some high school and some college education, respectively. The last three columns concerning question 11 reflect the responses of participants with college degree. Therefore, of the 209 participants, 3 had some high school education; 20, some college education; 122, a bachelor's degree; 59, a master's degree; and 5, a doctoral degree.

For instance, among the 122 participants with a bachelor's degree; 49 or 40.1 percent viewed the human resource information given in Set 2 of no help for making investment decisions; 31 or 25.4 percent, a little helpful; 31 or 25.4 percent, somewhat helpful; 8 or 6.5 percent,

TABLE 5-5

RELATIONSHIP BETWEEN USEFULNESS OF SET 2 AND LEVEL OF EDUCATION OF PARTICIPANTS

Usefulness of Set 2	Level of Education of the Participants					
	Some High School	Some College	Bachelor Degree	Master Degree	Doctoral Degree	Total Persons
None	1 33.3%	6 30.0%	49 40.1%	15 25.4%	2 40.0%	73 34.9%
Little	1 33.3%	4 20.0%	31 25.4%	21 35.6%	1 20.0%	58 27.8%
Some	1 33.3%	9 45.0%	31 25.4%	18 30.5%	0 0.0%	59 28.2%
Much	0 0.0%	1 5%	8 6.5%	5 8.5%	1 20.0%	15 7.2%
Very Much	0 0.0%	0 0.0%	3 2.5%	0 0.0%	1 20.0%	4 1.9%
TOTAL	3 100%	20 100%	122 100%	59 100%	5 100%	209 100%

much helpful; and 3 or 2.5 percent, very helpful.

Statistical Tests

Table 5-6 shows the results of the analysis of variance and the F ratio test. The result of the Chi-square test on the collapsed data in Table 5-5 is also shown in this table. The condensation of the data for rendering the Chi-square test was made by (1) combining columns 1 and 2 and columns 4 and 5 together and (2) collapsing together rows 3, 4, and 5.

Neither of the applied statistical tests supported the rejection of the null hypothesis at the 5 percent level of significance. Therefore, the degree of usefulness of information given in Set 2 appears to be the same to all users of the financial statements, regardless of their levels of the education. This point can be easily observed by comparing the calculated means of the five educational groups reported in Table 5-6.

Hypothesis A_3

The degree of usefulness of information provided in Set 2 is the same to all users of financial statements, regardless of the recency of the education of the users.

Descriptive Statistical Data

The information for this hypothesis was furnished through questions 1 and 10 of the questionnaire. Because

TABLE 5-6

RESULTS OF THE STATISTICAL TESTS
(FOR TABLE 5-5)

ANALYSIS OF VARIANCE

	Level of Education of the Participants				
	Some High School	Some College	Bachelor Degree	Master Degree	Doctoral Degree
Mean	2.0000	2.2500	2.0574	2.2203	2.6000
Standard Deviation	1.0000	0.9665	1.0703	0.9297	1.8166

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	2.5648	4	0.6412	0.5901
Within Groups	221.6829	204	1.0867	
Total	224.2477	208		

CHI-SQUARE

Chi square	4.9312
Degree of Freedom	4
Chi square/DF	1.2328
Contingency Coefficient	0.1518

the date of completion of the education for the participants ranged from 1930 to 1975, six classifications were used to accommodate different dates in which the respondents had completed their education as shown in Table 5-7. This table reflects the responses of 203 participants because six did not answer question 10.

A total of 59 or 29.1 percent of the 203 respondents completed their education before 1951; 25 or 12.3 percent, during 1951-55; 27 or 13.3 percent, during 1956-60; 27 or 13.3 percent, during 1961-65; 28 or 13.8 percent, during 1966-70; and 37 or 18.2 percent during 1971-75 or were in the process of completion.

Of the 37 participants whose education either had been completed during 1971-75 or were in process of completion, 4 or 10.8 percent viewed the human resource information given in Set 2 not useful for making investment decisions; 12 or 32.4 percent, a little helpful; 15 or 40.5 percent, somewhat helpful; 5 or 13.5 percent, much helpful; and 1 or 2.7 percent, very helpful.

Statistical Tests

The results of the both statistical tests reported in Table 5-8 suggested the rejection of the null hypothesis at the 5 percent level of significance. This rejection, therefore, implies a statistically significant relationship between the recency of the education and the usefulness of the human resource information given in Set 2.

For the Chi-square test, condensation of the data

TABLE 5-7

RELATIONSHIP BETWEEN USEFULNESS OF SET 2 AND THE DATE OF COMPLETION OF EDUCATION OF PARTICIPANTS

Usefulness of Set 2	Date of Completion of Education						
	Before 1950	1951 to 1955	1956 to 1960	1961 to 1965	1966 to 1970	1971 to 1975	Total
None	27 45.8%	9 36.0%	17 63.0%	9 33.3%	6 21.4%	4 10.8%	72 35.5%
Little	18 30.5%	4 16.0%	2 7.4%	7 25.9%	12 42.9%	12 32.4%	55 27.1%
Some	11 18.6%	7 28.0%	7 25.9%	9 33.3%	8 28.6%	15 40.5%	57 28.1%
Much	2 3.4%	5 20.0%	1 3.7%	1 3.7%	1 3.6%	5 13.5%	15 7.4%
Very much	1 1.7%	0 0	0 0	1 3.7%	1 3.6%	1 2.7%	4 2.0%
TOTAL	59 100.0%	25 100.0%	27 100.0%	27 100.0%	28 100.0%	37 100.0%	203 100.0%

TABLE 5-8

RESULTS OF THE STATISTICAL TESTS
(FOR TABLE 5-7)

ANALYSIS OF VARIANCE

	Date of Completion of Education					
	Before 1951	1951 to 1955	1956 to 1960	1961 to 1965	1966 to 1970	1971 to 1975
Mean	1.8475	2.3200	1.7037	2.1852	2.2500	2.6486
Standard Deviation	0.9616	1.1804	0.9929	1.0755	0.9670	0.9492

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	20.9556	5	4.1911	4.1189
Within Groups	200.4523	197	1.0175	
Total	221.4080	202		

CHI-SQUARE

Chi square	31.6111
Degree of Freedom	10
Chi square/DF	3.1611
Contingency Coefficient	0.3671

reported in Table 5-7 was required. This condensation was made by combining rows 3, 4, and 5 of the table.

In addition to the Chi-square test and the analysis of variance, the means of the different groups indicated that those respondents who had completed their education more recently viewed the human resource information more favorably than others. This finding is probably due, to a great extent, to the increasing support given during the last decade to the human resource accounting by some academicians and also to many articles written about the usefulness of human resource accounting.

The significant relationship revealed between the recency of education and the usefulness of the human resource information weakens when students are excluded from the calculations, because the Chi-square drops from 31.6111 to 11.3601, slightly more than the table value of 11.07 at the 5 percent level of significance with 10 degrees of freedom.

Hypothesis A_4

The degree of usefulness of information provided in Set 2 is the same to all users of financial statements, regardless of the level of familiarity of the users with human resource accounting.

Descriptive Statistical Data

The information for this hypothesis was gathered

through questions 1 and 7 of the questionnaire. Table 5-9 shows the frequency distribution for these two questions. According to this table from 209 participants, 58 or 27.8 percent were not familiar with human resource accounting; 58 or 27.8 percent, little familiar; 52 or 24.9 percent, somewhat familiar; 32 or 15.3 percent, familiar; and 9 or 4.3 percent, quite familiar. According to Table 5-10 of the 58 respondents who were not familiar with human resource accounting, 10 or 17.2 percent were CPAs; 14 or 24.1 percent, CFAs; 22 or 37.9 percent, trust or financial officers; 6 or 10.3 percent, managers; and 6 or 10.3 percent, students. The same information regarding those respondents who were "little," "somewhat," or "familiar" with human resource accounting can be obtained from Table 5-10.

This table also shows, for instance, that from 41 CPAs, 10 or 24.4 percent were not familiar with human resource accounting; 13 or 31.7 percent, little familiar; 11 or 26.8 percent, somewhat familiar; and 7 or 17.1 percent, familiar. (Percentages on Table 5-10 are calculated on vertical basis.) This table, in short, indicates that managers and students were more familiar with human resource accounting than other occupational groups.

Statistical Tests

Like previous cases, rows 3, 4, and 5 of the frequency distribution (Table 5-9) were collapsed together

TABLE 5-9

RELATIONSHIP BETWEEN USEFULNESS OF SET 2 AND FAMILIARITY OF PARTICIPANTS WITH HUMAN RESOURCE ACCOUNTING

Usefulness of Set 2	Degree of Familiarity with Human Resource Accounting					
	Not Familiar	Little Familiar	Somewhat Familiar	Familiar	Quite Familiar	Total Persons
None	17 29.3%	14 24.1%	26 50.0%	13 40.6%	3 33.3%	73 34.9%
Little	20 34.5%	17 29.3%	10 19.2%	10 31.3%	1 11.1%	58 27.8%
Some	18 31.0%	18 31.0%	13 25.0%	6 18.8%	4 44.4%	59 28.2%
Much	2 3.4%	8 13.8%	2 3.8%	2 6.3%	1 11.1%	15 7.2%
Very Much	1 1.7%	1 1.7%	1 1.9%	1 3.1%	0 0%	4 1.9%
TOTAL	58 100.0%	58 100.0%	52 100.0%	32 100.0%	9 100.0%	209 100.0%

TABLE 5-10

RELATIONSHIP BETWEEN PROFESSION AND FAMILIARITY OF PARTICIPANTS WITH HUMAN RESOURCE ACCOUNTING

Profession	Degree of Familiarity with Human Resource Accounting				
	Not Familiar	Little Familiar	Somewhat Familiar	Familiar*	Total Persons
CPAs	10 17.2%	13 22.4%	11 21.2%	7 17.1%	41 19.6%
CFAs	14 24.1%	12 20.7%	6 11.5%	2 4.9%	34 16.3%
Trust Officers	22 37.9%	14 24.1%	9 17.3%	2 4.9%	47 22.5%
Managers	6 10.3%	7 12.1%	18 34.6%	25 61.0%	56 26.8%
Students	6 10.3%	12 20.7%	8 15.4%	5 12.2%	31 14.8%
TOTAL	58 100.0%	58 100.0%	52 100.0%	41 100.0%	209 100.0%

*"Familiar" and "Quite Familiar" were combined.

for the purpose of running a Chi-square test. Furthermore, because a few individuals in question 7 reported to be "quite familiar" with human resource accounting, their responses were combined with those reported to be "familiar" with human resource accounting. Table 5-11 shows the results of the Chi-square test, the analysis of variance, and the F ratio test.

On the basis of those tests the null hypothesis was not rejected at the 5 percent level of significance, because the Chi-square and the F ratio were smaller than the corresponding table values.

However, a set of pair comparison Chi-square tests revealed a degree of association between the level of familiarity with human resource accounting and the usefulness of Set 2 for some of the groups as shown in Table 5-12. According to this table, the Chi-square for those who were "not familiar" vs. those who were "somewhat" familiar and those who were "little familiar" vs. those who were "somewhat" familiar did not support the rejection of the null hypothesis. This conclusion was also supported by the means of the groups, reported in Table 5-11. These means indicated that the human resource information given in Set 2 provided less help to those who were "somewhat" familiar with human resource accounting than others.

In short, the degree of usefulness of human resource information provided in Set 2 was the same to all users of

TABLE 5-11

RESULTS OF THE STATISTICAL TESTS
(FOR TABLE 5-9)

ANALYSIS OF VARIANCE

	Familiarity with Human Resource Accounting				
	Not Familiar	Little Familiar	Somewhat Familiar	Familiar	Quite Familiar
Mean	2.1379	2.3966	1.8846	2.0000	2.3333
Standard Deviation	0.9449	1.0586	1.0414	1.0776	1.1180

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	8.1652	4	2.0413	1.9272
Within Groups	216.0823	204	1.0592	
Total	224.2475	208		

CHI-SQUARE

Chi square	10.4593
Degree of Freedom	6
Chi square/DF	1.7432
Contingency Coefficient	0.2183

TABLE 5-12

PAIR COMPARISON TEST FOR FAMILIARITY WITH HUMAN RESOURCE ACCOUNTING AND USEFULNESS OF SET 2

Pairs	Chi Square	Contingency Coefficient	Rank
Not Familiar vs. Little Familiar	0.3962	0.0583	1
Not Familiar vs. Somewhat Familiar	4.9293	0.2071	5
Not Familiar vs. Familiar	1.0200	0.1010	2
Little Familiar vs. Somewhat Familiar	7.9249	0.2592	6
Little Familiar vs. Familiar	2.5203	0.1576	4
Somewhat Familiar vs. Familiar	1.1151	0.1088	3

*In all the above cases, the degree of freedom is one.

financial statements, regardless of their familiarity with human resource accounting, except for those who were "somewhat" familiar with human resource accounting.

Hypothesis A_5

The degree of usefulness of information provided in Set 2 is the same to all users of financial statements, regardless of what portion of the users jobs involve consulting or advising investors how to manage their investment.

Descriptive Statistical Data

The information for this hypothesis was gathered through questions 1 and 12 of the questionnaire. Table 5-13 shows the frequency distribution for these questions. According to this table, 80 or 38.3 percent of 209 participants stated that the task of consulting or advising investors and companies in managing their investments was encountered hardly in their jobs. Thirty-one students participating in the study were among this group. The table also indicates that 34 or 16.3 percent of the total participants stated that the forementioned task was encountered occasionally in their jobs; 39 or 18.7 percent, encountered frequently; 22 or 10.5 percent said that it constitutes a considerable part of their jobs; and 34 or 16.3 percent the main part of their jobs.

TABLE 5-13

RELATIONSHIP BETWEEN USEFULNESS OF SET 2 AND LEVEL OF ADVISING INVESTORS

Usefulness of Set 2	Level of Advising Investors					
	Hardly	Occas-ionally	Fre-quently	Major Job	Main Job	Total Persons
None	19 23.7%	19 55.9%	15 38.5%	8 36.4%	12 35.3%	73 34.9%
Little	25 31.3%	3 8.8%	12 30.8%	10 45.5%	8 23.5%	58 27.8%
Some	26 32.5%	7 20.6%	9 23.1%	4 18.2%	13 38.2%	59 28.2%
Much	8 10.0%	4 11.8%	2 5.1%	0 0%	1 2.9%	15 7.2%
Very much	2 2.5%	1 2.9%	1 2.6%	0 0%	0 0%	4 1.9%
TOTAL	80 100.0%	34 100.0%	39 100.0%	22 100.0%	34 100.0%	209 100.0%

Statistical Test

To determine the degree of association between usefulness of Set 2 and the task of consulting investors how to manage their investment, data in Table 5-13 were collapsed and examined by application of a Chi-square test. The results of such a test, the analysis of variance, and the F ratio test are shown in Table 5-14.

According to the Chi-square test, the null hypothesis was rejected at the 5 percent level of significance and indicated a statistically significant association between these two variables. On the contrary, the F ratio test did not support the rejection of the null hypothesis at the 5 percent level of significance. These contrasting conclusions could have been caused by either collapsing or transformation of the raw data.

However, the results of the pair comparison Chi-square tests, reported in Table 5-15 indicated that the main difference of view concerning the usefulness of Set 2 appeared to exist between those individuals who hardly encounter the task of advising investors and those who occasionally encounter such a task. The difference of opinion appeared also to be noticeable between those who occasionally encounter the task of advising and those for whom the task was the major job.

The significant divergence of opinion between the first mentioned two groups was caused by combining students

TABLE 5-14

RESULTS OF THE STATISTICAL TESTS
(FOR TABLE 5-13)

ANALYSIS OF VARIANCE

	Level of Advising Investors				
	Hardly	Occa-sionally	Fre-quently	Major Job	Main Job
Mean	2.3625	1.9706	2.0256	1.8182	2.0882
Standard Deviation	1.0341	1.2428	1.0384	0.7327	0.9331

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	7.8084	4	1.9521	1.8399
Within Groups	216.4394	204	1.0610	
Total	224.2478	208		

CHI-SQUARE

Chi square	18.9075
Degree of Freedom	8
Chi square/DF	2.3634
Contingency Coefficient	0.2880

TABLE 5-15

PAIR COMPARISON TEST FOR DIFFERENT LEVELS OF ADVISING INVESTORS (SET 2)

Level of Advising Investors	Chi Square	Contingency Coefficient	Rank
Hardly encountered vs. Occasionally enc.	11.0856	.2977	6
Hardly encountered vs. Frequently enc.	2.7805	.1511	3
Hardly encountered vs. Main part of job	2.3054	.1291	2
Occasionally enc. vs. Frequently enc.	2.2154	.1716	4
Occasionally enc. vs. Main part of job	3.5043	.1936	5
Frequently enc. vs. Main part of job	0.0746	.0280	1

*In all the above cases, the degree of freedom is one.

and non-students. When students were excluded from the Chi-square calculation, the divergence was not as significant as reported in Table 5-15. However, the divergence of opinion still remained significant for the other two groups and indicated that those whose major job was advising investors viewed the human resource information more useful than those advise occasionally.

Hypothesis A_6

The degree of usefulness of information provided in Set 2 is the same to all users of financial statements, regardless of how much the users rely upon and use published financial statements.

Descriptive Statistical Data

The information for this hypothesis was furnished through questions 1 and 13 of the questionnaire. The frequency distributions for these questions is shown in Table 5-16. Because one of 209 participants did not answer question 13, the aforementioned table represents the views of 208 individuals. According to these data, 5 or 2.4 percent did not rely upon and use such statements; 10 or 4.8 percent relied upon and used such statements to a little extent; 51 or 24.5 percent, to some extent; 77 or 37.0 percent, to much extent; and 65 or 31.3 percent, to the extent of very much. The table also reveals that, for instance, 27 or 41.5 percent of those respondents who use and rely very much upon the information given in published

TABLE 5-16

RELATIONSHIP BETWEEN USEFULNESS OF SET 2 AND RELIANCE OF PARTICIPANTS UPON FINANCIAL STATEMENTS

Usefulness of Set 2	Reliance of Participants Upon Published Financial Statements					
	None	Little	Some	Much	Very Much	Total Persons
None	2 40.0%	3 30.0%	12 23.5%	29 37.7%	27 41.5%	73 35.1%
Little	2 40.0%	5 50.0%	20 39.2%	19 24.7%	12 18.5%	58 27.9%
Some	0 0	2 20%	15 29.4%	22 28.6%	19 29.2%	58 27.9%
Much	1 20.0%	0 0%	4 7.8%	5 6.5%	5 7.7%	15 7.2%
Very Much	0 0%	0 0%	0 0%	2 2.6%	2 3.1%	4 1.9%
TOTAL	5 100.0%	10 100.0%	51 100.0%	77 100.0%	65 100.0%	208 100.0%

financial statements, viewed human resource information given in Set 2 not useful for making investment decisions. Similar information can be acquired from the table for the other cases.

Statistical Test

To determine whether those who relied upon and used published financial statements for making investment decisions viewed set 2 differently from those who did not heavily rely upon published financial statements, the data reported in Table 5-16 were collapsed and a Chi-square test, analysis of variance, and F ratio test were employed. The results of these tests, reported in Table 5-17, did not suggest the rejection of the null hypothesis. Consequently, a conclusion was made that no significant association existed between the usefulness of Set 2 and the degree of reliance on published financial statements at the 5 percent level of significance.

Hypothesis B

The same procedures and statistical techniques were used to describe and test hypothesis B and the sub-hypotheses. To avoid repetition, therefore, some of the explanations are omitted. This hypothesis was stated as follows:

> Information provided in Set 3 regarding a firm's human resources is not useful to the users of financial

TABLE 5-17

RESULTS OF THE STATISTICAL TESTS
(FOR TABLE 5-16)

ANALYSIS OF VARIANCE

Reliance of Participants upon Published Financial Statements

	None	Little	Some	Much	Very Much
Mean	2.0000	1.9000	2.2157	2.1169	2.1231
Standard Deviation	1.2247	0.7379	0.9014	1.0757	1.1389

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	1.0043	4	0.2511	0.2291
Within Groups	222.4898	207	1.0960	
Total	223.4940			

CHI-SQUARE

Chi square	10.8098
Degree of Freedom	6
Chi square/DF	1.8016
Contingency Coefficient	0.2223

statements for making investment decisions.

The information for this hypothesis was gathered through question 2 of the questionnaire. Tables 5-18 (similar to Table 5-1) and 5-19 (similar to Table 5-2) illustrate the descriptive data and the results of the statistical test. Because the result of the Chi-square test was larger than the table value at the 5 percent level of significance, the null hypothesis was rejected indicating that human resource information given in Set 3 is a little useful. However, this conclusion was not reached and the null hypothesis was not rejected when students were excluded from the calculation.

Hypothesis B_1

The degree of usefulness of information provided in Set 3 is the same to all users of financial statements, regardless of the profession of the users.

The data for this hypothesis were furnished through questions 2 and 8 of the questionnaire. Tables 5-20 (similar to Table 5-3) and 5-21 (similar to Table 5-4) demonstrate the descriptive data and the results of the statistical tests.

The results of the Chi-square and the F ratio tests suggested the rejection of the null hypothesis, because the calculated values of the Chi-square and F ratio were larger than the corresponding table values at the 5 percent

TABLE 5-18

OPINION OF PARTICIPANTS REGARDING SET 3

Degree of Usefulness	No. of People	% of People	Index Number	Magnitude
None	86	41.1	1	86
Little	59	28.2	2	118
Some	40	19.1	3	120
Much	17	8.1	4	68
Very Much	7	3.3	5	35
Total	209	100.0		427

Mean = $\frac{427}{209}$ = 2.043

Standard Deviation 1.1107

TABLE 5-19

RESPONSES REGARDING THE USEFULNESS OF SET 3

	Not Useful	Useful	Total Individual
Observed	86	123	209
Expected	104.5	104.5	209

Chi square	6.55
Degree of Freedom	1
Chi Square/DF	6.55

TABLE 5-20

RELATIONSHIPS BETWEEN USEFULNESS OF SET 3 AND PROFESSION OF PARTICIPANTS

Usefulness of Set 3	Profession					Total Persons
	CPAs	CFAs	Trust Officers	Managers	Students	
None	22 53.7%	15 44.1%	15 31.9%	32 57.1%	2 6.5%	86 41.1%
Little	10 24.4%	11 32.4%	17 36.2%	12 21.4%	9 29.0%	59 28.2%
Some	5 12.2%	7 20.6%	8 17.0%	6 10.7%	14 45.2%	40 19.1%
Much	2 4.9%	1 2.9%	4 8.5%	5 8.9%	5 16.1%	17 8.1%
Very much	2 4.9%	0 0%	3 6.4%	1 1.8%	1 3.2%	7 3.3%
Total	41 100.0%	34 100.0%	47 100.0%	56 100.0%	31 100.0%	209 100.0%

TABLE 5-21

RESULTS OF THE STATISTICAL TESTS
(FOR TABLE 5-20)

ANALYSIS OF VARIANCE

Profession of the Participants

	CPAs	CFAs	Trust Officers	Managers	Students
Mean	1.8293	1.8235	2.2128	1.7679	2.8065
Standard Deviation	1.1380	0.8694	1.1784	1.0786	0.9099

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	27.1732	4	6.7933	6.0401
Within Groups	229.4384	204	1.1247	
Total	256.6116	208		

CHI-SQUARE

Chi square	32.3169
Degree of Freedom	8
Chi square/DF	4.0396
Contingency Coefficient	0.3659

PAIR COMPARISON TESTS

Pairs	Chi Square	Contingency Coefficient	Rank
CPAs vs. CFAs	0.6769	0.0945	2
CPAs vs. Mgt.	0.1164	0.0346	1
CFAs vs. TOs	1.2597	0.1238	3
CFAs vs. Mgts.	1.4385	0.1254	4
CPAs vs. TOs	4.2487	0.2146	5
TOs vs. Mgt.	6.5554	0.2446	6

*In all the above cases, the degree of freedom is one.

level of significance.

The results of the pair comparison Chi-square tests and the calculated mean for each professional group indicated a significant difference of opinion between managers and trust officers regarding the usefulness of Set 3. The difference of opinion also appeared to be noticeable between CPAs and trust officers. In other words, the trust officers and students rated the usefulness of Set 3 higher than what did the CPAs, CFAs, and managers.

Hypothesis B_2

The degree of usefulness of information provided in Set 3 is the same to all users of financial statements, regardless of the level of education of the users.

The information gathered through questions 2, 9, and 11 of the questionnaire assisted the analysis of this hypothesis. Tables 5-22 (similar to Table 5-5) and 5-23 (similar to Table 5-6) show the frequency distribution and the results of the statistical tests for this hypothesis.

Because the F ratio and the Chi-square were smaller than the corresponding table values at the 5 percent level of significance, the null hypothesis was not rejected. This conclusion, therefore, indicates that level of education had no significant impact on the opinion of the participants concerning the usefulness of Set 3. This conclusion is the same as that of hypothesis A_2.

TABLE 5-22

RELATIONSHIP BETWEEN USEFULNESS OF SET 3 AND LEVEL OF EDUCATION OF PARTICIPANTS

Usefulness of Set 3	Level of Education of the Participants					
	Some High School	Some College	Bachelor Degree	Master Degree	Doctoral Degree	Total Persons
None	1 33.3%	6 30.0%	59 48.4%	18 30.5%	2 40.0%	86 41.1%
Little	1 33.3%	5 25.0%	29 23.8%	23 39.0%	1 20.0%	59 28.2%
Some	0 0%	7 35.0%	19 15.6%	13 22.0%	1 20.0%	40 19.1%
Much	1 33.3%	1 5.0%	11 9.0%	3 5.1%	1 20.0%	17 8.1%
Very Much	0 0%	1 5.0%	4 3.2%	2 3.4%	0 0%	7 3.3%
TOTAL	3 100.0%	20 100.0%	122 100.0%	59 100.0%	5 100.0%	209 100.0%

TABLE 5-23

RESULTS OF THE STATISTICAL TESTS
(FOR TABLE 5-22)

ANALYSIS OF VARIANCE

	Level of Education of the Participants				
	Some High School	Some College	Bachelor Degree	Master Degree	Doctoral Degree
Mean	2.3333	2.3000	1.9508	2.1186	2.2000
Standard Deviation	1.5275	1.1286	1.1416	1.0185	1.3038

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	3.0713	4	0.7679	0.6178
Within Groups	253.5399	204	1.2428	
Total	256.6111			

CHI-SQUARE

Chi square	8.1044
Degree of Freedom	4
Chi square/DF	2.0261
Contingency Coefficient	0.1932

Hypothesis B_3

The degree of usefulness of information provided in Set 3 is the same to all users of financial statements, regardless of the recency of the education of the users.

The information for this hypothesis was gathered through questions 2 and 10 of the questionnaire. Tables 5-24 (similar to Table 5-7) and 5-25 (similar to Table 5-8) summarize the descriptive data and the results of the statistical tests for this hypothesis.

The null hypothesis was rejected, because the Chi-square was larger than the table value at the 5 percent level of significance. The same conclusion was also reached by using the F ratio test. This conclusion, however, was not reached when students were excluded from the calculation. In short, the recency of education appeared to have some impact on the opinion of the respondents, concerning the usefulness of Set 3.

Hypothesis B_4

The degree of usefulness of information provided in Set 3 is the same to all users of financial statements, regardless of level of the familiarity of the users with human resource accounting.

The data for this hypothesis were furnished through questions 2 and 7 of the questionnaire. The frequency distribution and the results of the statistical tests are reported

TABLE 5-24

RELATIONSHIP BETWEEN USEFULNESS OF SET 3 AND THE DATE OF COMPLETION OF EDUCATION OF PARTICIPANTS

Usefulness of Set 3	Date of Completion of Education						
	Before 1950	1951 to 1955	1956 to 1960	1961 to 1965	1966 to 1970	1971 to 1975	Total
None	33 55.9%	11 44.0%	15 55.6%	12 44.4%	8 28.6%	7 18.9%	86 42.4%
Little	18 30.5%	4 16.0%	8 29.6%	4 14.8%	9 32.1%	12 32.4%	55 27.1%
Some	3 5.1%	7 28.0%	2 7.4%	6 22.2%	9 32.1%	12 32.4%	39 19.2%
Much	5 8.5%	2 8.0%	1 3.7%	3 11.1%	0 0%	5 13.5%	16 7.9%
Very much	0 0%	1 4.0%	1 3.7%	2 7.4%	2 7.1%	1 2.7%	7 3.4%
TOTAL	59 100.0%	25 100.0%	27 100.0%	27 100.0%	28 100.0%	37 100.0%	203 100.0%

TABLE 5-25

RESULTS OF THE STATISTICAL TESTS
(FOR TABLE 5-24)

ANALYSIS OF VARIANCE

	Date of Completion of Education					
	Before 1951	1951 to 1955	1956 to 1960	1961 to 1965	1966 to 1970	1971 to 1975
Mean	1.6610	2.1200	1.7037	2.2222	2.2400	2.4865
Standard Deviation	0.9212	1.2014	1.0309	1.3397	1.1097	1.0441

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	21.1728	5	4.2346	3.6168
Within Groups	230.6492	197	1.1708	
Total	251.8220	202		

CHI-SQUARE

Chi square	27.4656
Degree of Freedom	10
Chi square/DF	2.7466
Contingency Coefficient	0.3452

in Tables 5-26 (similar to Table 5-9), 5-27 (similar to Table 5-11), and 5-28 (similar to Table 5-12).

According to the applied statistical tests, the null hypothesis could not be rejected at the 5 percent level of significance. However, the outcomes of the pair comparison Chi-square tests, reported in Table 5-28, and the mean of each group suggested that those who were only "somewhat" familiar with human resource accounting viewed the usefulness of Set 3 less favorably than others.

Hypothesis B_5

The degree of usefulness of information provided in Set 3 is the same to all users of financial statements, regardless of what portion of the users jobs involve consulting or advising investors how to manage their investments.

Questions 2 and 12 of the questionnaire provided information for analyzing this hypothesis. Tables 5-29 (similar to 5-13), 5-30 (similar to Table 5-14), and 5-31 (similar to Table 5-14) show the results of the analysis.

In contrast to the conclusion of hypothesis A_5, in this hypothesis the Chi-square test did not suggest the rejection of the null hypothesis, while the F ratio test did. This contrasting results, again, could be due to the collapsing and transformation of the raw data used for these tests. However, the results of the pair comparison Chi-square tests, reported in Table 5-31, and the calculated

TABLE 5-26

RELATIONSHIP BETWEEN USEFULNESS OF SET 3 AND FAMILIARITY OF PARTICIPANTS WITH HUMAN RESOURCE ACCOUNTING

Usefulness of Set 3	Degree of Familiarity with Human Resource Accounting					
	Not Familiar	Little Familiar	Somewhat Familiar	Familiar	Quite Familiar	Total Persons
None	22 37.9%	18 31.0%	29 55.8%	13 40.6%	4 44.4%	86 41.1%
Little	18 31.0%	18 31.0%	11 21.2%	12 37.5%	0 0%	59 28.2%
Some	12 20.7%	13 22.4%	9 17.3%	2 6.3%	4 44.4%	40 19.1%
Much	4 6.9%	7 12.1%	2 3.8%	3 9.4%	1 11.1%	17 8.1%
Very Much	2 3.4%	2 3.4%	1 1.9%	2 6.3%	0 0%	7 3.3%
TOTAL	58 100.0%	58 100.0%	52 100.0%	32 100.0%	9 100.0%	209 100.0%

TABLE 5-27

RESULTS OF THE STATISTICAL TESTS
(FOR TABLE 5-26)

ANALYSIS OF VARIANCE

	Familiarity with Human Resource Accounting				
	Not Familiar	Little Familiar	Somewhat Familiar	Familiar	Quite Familiar
Mean	2.0690	2.2586	1.7500	2.0313	2.2222
Standard Deviation	1.0900	1.1326	1.0073	1.2044	1.2018

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	7.4933	4	1.8733	1.5340
Within Groups	249.1186	204	1.2212	
Total	256.6118	208		

CHI-SQUARE

Chi square	7.5576
Degree of Freedom	6
Chi square/DF	1.2596
Contingency Coefficient	0.1868

TABLE 5-28

PAIR COMPARISON TEST FOR FAMILIARITY WITH HUMAN RESOURCE ACCOUNTING AND USEFULNESS OF SET 3

Pairs	Chi Square	Contingency Coefficient	Rank
Not Familiar vs. Little Familiar	0.6105	0.0724	2
Not Familiar vs. Somewhat Familiar	3.5083	0.1758	5
Not Familiar vs. Familiar	0.1255	0.0356	1
Little Familiar vs. Somewhat Familiar	6.8549	0.2422	6
Little Familiar vs. Familiar	1.1431	0.1068	3
Somewhat Familiar vs. Familiar	1.8769	0.1406	4

*In all the above cases, the degree of freedom is one.

TABLE 5-29

RELATIONSHIP BETWEEN USEFULNESS OF SET 3 AND LEVEL OF ADVISING INVESTORS

Usefulness of Set 3	Level of Advising Investors					
	Hardly	Occas-ionally	Fre-quently	Major Job	Main Job	Total Persons
None	24 30.0%	19 55.9%	18 46.2%	11 50.0%	14 41.2%	86 41.1%
Little	23 28.7%	5 14.7%	12 30.8%	8 36.4%	11 32.4%	59 28.2%
Some	19 23.7%	6 17.6%	5 12.8%	2 9.1%	8 23.5%	40 19.1%
Much	10 12.5%	3 8.8%	2 5.1%	1 4.5%	1 2.9%	17 8.1%
Very Much	4 5.0%	1 2.9%	2 5.1%	0 0%	0 0%	7 3.3%
TOTAL	80 100.0%	34 100.0%	39 100.0%	22 100.0%	34 100.0%	209 100.0%

TABLE 5-30

RESULTS OF THE STATISTICAL TESTS
(FOR TABLE 5-29)

ANALYSIS OF VARIANCE

	Level of Advising Investors				
	Hardly	Occa-sionally	Fre-quently	Major Job	Main Job
Mean	2.3375	1.8824	1.9231	1.6818	1.8824
Standard Deviation	1.1794	1.1746	1.1329	0.8387	0.8796

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	12.1240	4	3.0310	2.5291
Within Groups	244.4871	204	1.1985	
Total	256.6111	208		

CHI-SQUARE

Chi square	13.8428
Degree of Freedom	8
Chi square/DF	1.7303
Contingency Coefficient	0.2492

TABLE 5-31

PAIR COMPARISON TEST FOR DIFFERENT LEVELS OF ADVISING INVESTORS (SET 3)

Level of Advising Investors	Chi Square	Contingency Coefficient	Rank
Hardly encountered vs. Occasionally enc.	6.8038	0.2373	6
Hardly encountered vs. Frequently enc.	2.9958	0.1567	5
Hardly encountered vs. Main part of job	3.0644	0.1484	4
Occasionally enc. vs. Frequently enc.	0.6878	0.0966	2
Occasionally enc. vs. Main part of job	1.0695	0.1084	3
Frequently enc. vs. Main part of job	.0212	0.0149	1

*In all the above cases, the degree of freedom is one.

mean for each group, shown in Table 5-30, indicated a noticeable difference of view concerning the usefulness of Set 3 between those who hardly encountered the task of advising and the rest of the participants. This was mainly because that all students were among those who hardly did advising job.

Hypothesis B_6

The degree of usefulness of information provided in Set 3 is the same to all users of financial statements, regardless of how much the users rely upon and use published financial statements.

The information for this hypothesis was gathered through questions 2 and 13. The frequency distribution and the outcomes of the statistical analysis are shown in Tables 5-32 (similar to Table 5-16), and 5-33 (similar to Table 5-17).

Based on the outcomes of the applied statistical tests, the null hypothesis was not rejected at the 5 percent level of significance. This is the same conclusion reached in regard to hypothesis A_6.

Hypothesis C

The degree of usefulness of the human resource statement Set 2 is the same as that of Set 3 to the users of financial statements for making investment decisions.

Descriptive Statistical Data

Information gathered through questions 3, 5, and 7 of the questionnaire assisted analyses and testing of

TABLE 5-32

RELATIONSHIP BETWEEN USEFULNESS OF SET 3 AND RELIANCE OF PARTICIPANTS UPON FINANCIAL STATEMENTS

Usefulness of Set 3	Reliance of Participants Upon Published Financial Statements					
	None	Little	Some	Much	Very Much	Total Persons
None	2 40.0%	4 40.0%	17 33.3%	32 41.6%	31 47.7%	86 41.3%
Little	2 40.0%	3 30.0%	17 33.3%	24 31.2%	13 20.0%	59 28.4%
Some	0 0%	3 30.0%	10 19.6%	13 16.9%	13 20.0%	39 18.8%
Much	1 20.0%	0 0%	5 9.8%	6 7.8%	5 7.7%	17 8.2%
Very Much	0 0%	0 0%	2 3.9%	2 2.6%	3 4.6%	7 3.4%
TOTAL	5 100.0%	10 100.0%	51 100.0%	77 100.0%	65 100.0%	208 100.0%

TABLE 5-33

RESULTS OF THE STATISTICAL TESTS
(FOR TABLE 5-32)

ANALYSIS OF VARIANCE

Reliance of Participants upon Published Financial Statements

	None	Little	Some	Much	Very Much
Mean	2.0000	1.9000	2.1765	1.9870	2.0154
Standard Deviation	1.2247	0.8756	1.1262	1.0698	1.1923

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	1.4089	4	0.3522	0.2812
Within Groups	254.2821	203	1.2526	
Total	255.6910	207		

CHI-SQUARE

Chi square	4.3634
Degree of Freedom	6
Chi square/DF	0.7272
Contingency Coefficient	0.1433

this hypothesis. Question 3 reads as follows:

> If you were considering an investment in the stocks of the ABC Company, how much would the information provided in Set 3, in addition to that given in Set 2, help you to make a better investment decision?

The frequency distribution for this question and question 7, presented in Table 5-34, shows that of 209 participants, 97 or 46.4 percent reported that Set 3 provided no additional help for making investment decisions; 58 or 27.8 percent, little additional help; 32 or 15.3 percent, some additional help; 18 or 8.6 percent, much additional help; and 4 or 1.9 percent, very much additional help. Moreover, the table shows that of 97 individuals who reported that Set 3 provided no additional help, 22 or 22.7 percent were CPAs; 18 or 18.6 percent, CFAs; 19 or 19.6 percent, trust or financial officers; 34 or 35.1 percent, managers; and 4 or 4.1 percent, students.

In addition to question 3, question 5 also furnished further information about hypothesis C. This question was stated in the questionnaire as below.

> Between Set 2 and Set 3, which one would you prefer to have as supplementary information to the conventional financial statements?

Table 5-35 illustrates the frequency distribution for this question and question 7. According to this table 85 persons or 40.7 percent of 209 participants preferred neither set;

TABLE 5-34

OPINION OF DIFFERENT PROFESSIONAL GROUPS CONCERNING THE SUPERIORITY OF SET 3 OVER SET 2

Usefulness of Set 3 Over Set 2	Profession					
	CPAs	CFAs	Trust Officers	Managers	Students	Total Persons
None	22 53.7%	18 52.9%	19 40.4%	34 60.7%	4 12.9%	97 46.4%
Little	10 24.4%	8 23.5%	13 27.7%	11 19.6%	16 51.6%	58 27.8%
Some	4 9.8%	7 20.6%	9 19.1%	6 10.7%	6 19.4%	32 15.3%
Much	4 9.8%	1 2.9%	4 8.5%	4 7.1%	5 16.1%	18 8.6%
Very Much	1 2.4%	0 0%	2 4.3%	1 1.8%	0 0%	4 1.9%
TOTAL	41 100.0%	34 100.0%	47 100.0%	56 100.0%	31 100.0%	209 100.0%

TABLE 5-35

CHOICE OF A SUPPLEMENTARY STATEMENT

Set	Profession					
	CPAs	CFAs	Trust Officers	Managers	Students	Total Persons
Neither	20 48.8%	15 44.1%	20 42.6%	30 53.6%	0 0%	85 40.7%
Set 2	15 36.6%	10 29.4%	11 23.4%	14 25.0%	14 45.2%	64 30.6%
Set 3	6 14.6%	9 26.5%	16 34.0%	12 21.4%	17 54.8%	60 28.7%
TOTAL	41 100.0%	34 100.0%	47 100.0%	56 100.0%	31 100.0%	209 100.0%

64 or 30.6 percent, Set 2; and 60 or 28.7 percent, Set 3. From 85 persons who preferred neither set, 20 or 23.5 percent were CPAs; 15 or 17.6 percent, CFAs; 20 or 23.5 percent, trust or financial officers; 30 or 35.3 percent, managers; and none students. Inference from this table was that students and trust officers were more in favor of Set 3 than other professional groups.

Information furnished through question 4 also revealed that those who preferred to have either Set 2 or Set 3 as a supplementary source of information, 16 suggested such information be reported as part of the conventional financial statements: 47, as footnotes to the conventional financial statements; and 75, through a separate supplementary set of financial statements. Table 5-36 shows the suggestion given by different professional groups.

Statistical Test

Data reported in Tables 5-1 and 5-18 were collapsed and reported in Table 6-37.

The lower part of Table 5-37 shows the results of the analysis of variance, F ratio test, and a Chi-square test rendered on the data displayed in this table. The results of these statistical tests did not suggest the rejection of the null hypothesis at the 5 percent level of significance. In other words, neither of two measurement models used for the preparation of Sets 2 and 3 was better than the other.

TABLE 5-36

PREFERRED METHOD OF REPORTING

Method of Reporting	Profession of Participant					Total Persons
	CPAs	CFAs	Trust Officers	Managers	Students	
Part of conventional financial statements	1 2.4%	1 2.9%	2 4.3%	2 3.6%	10 32.3%	16 7.7%
Footnote to conventional financial statements	6 14.6%	9 26.5%	16 34.0%	10 17.9%	6 19.4%	47 22.5%
Separate supplementary financial statements	20 48.8%	11 32.2%	14 29.8%	15 26.8%	15 48.4%	75 35.9%
Not to be reported	14 34.1%	13 38.2%	15 31.9%	29 51.8%	0 0	71 34.0%
TOTAL	41 100.0%	34 100.0%	47 100.0%	56 100.0%	31 100.0%	209 100.0%

TABLE 5-37

COMPARATIVE DATA FOR SET 2 AND SET 3

Usefulness	Index Number	Set 2		Set 3	
		No. of Persons	Magni-tude	No. of Persons	Magni-tude
None	1	73	73	86	86
Little	2	58	116	59	118
Some	3	59	177	40	120
Much	4	15	60	17	68
Very Much	5	4	20	7	35
Total			446		427
Mean			2.1340		2.0431
Standard Deviation			1.0383		1.1107

ANALYSIS OF VARIANCE

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	0.8637	1	0.8637	0.7472
Within Groups	480.8586	416	1.1559	
Total	481.7222	417		

CHI-SQUARE

Chi square	5.659
Degree of Freedom	4
Chi Square/DF	1.4147
Contingency Coefficient	0.1156

In addition to the foregoing statistical tests, a Chi-square test was also run on the data extracted from Table 5-35. These data and the results of the Chi-square test are shown in Table 5-38. According to this test, likewise, the null hypothesis was not rejected at the 5 percent level of significance because the value of Chi-square was smaller than the corresponding table value.

To examine the validity of the preceding statistical tests, Wilcoxon Signed-Ranks, a nonparametric technique, was also employed to test this hypothesis.[1] This test was run for each professional group separately and for all professional groups collectively. Table 5-39 summarizes the results of the Wilcoxon Signed-Ranks test.

The outcomes of this test did not either suggest the rejection of the null hypothesis, since the calculated T value in each case was larger than the corresponding table value. (Unlike F or Chi-square, the smaller the T the more significant it is.)[2] Consequently, the conclusion was reached that at the 5 percent level of significance no statistically important difference existed between the usefulness of the acquisition cost model and the proposed model for measuring human resources of a business organization.

TABLE 5-38

CHOICE OF A SUPPLEMENTARY STATEMENT BY DIFFERENT PROFESSIONS

Preferred Set	Profession					
	CPAs	CFAs	Trust Officers	Managers	Students	Total Persons
Set 2	15 71.42%	10 52.63%	11 40.74%	14 53.84%	14 45.16%	64 51.61%
Set 3	6 28.58%	9 47.37%	16 59.26%	12 46.16%	17 54.84%	60 48.39%
TOTAL	21 100.0%	19 100.0%	27 100.0%	26 100.0%	31 100.0%	124 100.0%

Chi square	5.1539
Degree of Freedom	4
Chi square/DF	1.2885

TABLE 5-39

WILCOXON SIGNED-RANKS

Professional Groups	$-\Sigma$	$+\Sigma$	T	N	Table Value at 5%	Conclusion
CPAs	12	54	12	11	11	12 > 11
CFAs	4.5	31.5	4.5	8	4	4.5 > 4
Trust Officers	53	92.5	53	17	35	53 > 35
Managers	60	76	60	16	30	60 > 30
Students	32.5	33.5	32.5	11	11	32.5 > 11
Total Groups	706	1310	706	63	(See below)	

$$T_e = \frac{N(N+1)}{4} = \frac{63(63+1)}{4} = 1008$$

$$\text{Standard Deviation of } T = \sqrt{\frac{N(N+1)\cdot(2N+1)}{24}} = 146.1$$

$$Z = \frac{T-T_e}{T} = 2.067$$

Table value of Z at 5% level of significance = 1.96

Conclusion $2.067 > 1.96$; H_0 was not rejected.

Other Findings of the Study

Views of the Managers of the R. G. Barry Corporation

The sample of 452 users of financial statements included 21 managers of the R. G. Barry Corporation. Their views were expected to provide additional information, inasmuch as this corporation is the pioneer in implementing human resource accounting.

Of these managers who had received the questionnaire, only seven responded. Of the seven, three indicated that they were quite familiar with human resource accounting; three, familiar; and one, somewhat familiar. Concerning statements of Set 2, two of these managers believed that it was much helpful and five stated that it was somewhat helpful for making investment decisions.

In regard to statements of Set 3, two of the seven viewed it much helpful; another two, somewhat helpful; the other two, little helpful; and one, not useful for making investment decisions. When comparing Sets 2 and 3, four of the managers preferred Set 2 and the others preferred Set 3. Furthermore, five of these managers suggested that information provided in either Set 2 or 3 to be reported in a separate supplementary financial statement and two in the footnotes to the financial statements.

The comparison of their views with those of other 49 managers of the Fortune 500 largest companies in the United States revealed that managers of the R. G. Barry

Corporation were much in favor of human resource accounting. This favorable attitude toward human resource accounting showed by these managers may be possibly due to the practical application, because these individuals have had opportunities to utilize the actual outcomes of a human resource accounting.

Of the seven managers, two stated that information in Set 3 was much useful for making investment decisions; two, somewhat helpful; another two, little helpful; and the remaining one, not helpful. Interestingly enough, three managers preferred Set 3, even though all seven could have been expected to prefer Set 2, because their company has been using it for some years.

Reasons for Selecting Particular Set of Statements

In question six of the questionnaire, the participants were asked to state briefly their reasons for selecting statements Set 2, Set 3, or neither. Here are some of the reasons given by the participants who answered the question:

Reasons for Selecting Set 3

> more detail, more complete, seems to give more information, provides more information, more possibility of comparison.
>
> seems to fairly handle the concept and would be useful as a separate statement for analysis only.
>
> Believe Set 3 provides for fuller disclosure than Set 2.

If it has value to anyone, the total impact is better than partial impact.

more information relating to human resources is always helpful. Tangible assets are accounted for, however, human resources, their value, cost, and their expected contributions are valuable items of information to investors and lenders.

Set 3 has more information given than Set 1 or 2. More is taken into consideration in human assets that aren't considered in 1 or 2.

The information in Set 2 provides little information of a useful nature other than to show the dollar amount of human assets capitalized. Set 3 gives more information which might be of some value in projecting future years' benefits that might be derived from these human assets.

While I seriously doubt the value of the capitalized costs in Set 2, Set 3 does give a basis for evaluating the relative importance of these cost.

Compensation frequently is not reported as a separate item on an income statement. A note as suggested above may give additional information. It would be, of course, less conservative to capitalized costs in Sets 2 and 3 and probably a mistake. It is interesting to have that expense figure, however.

The Set 3, when completely understood, should provide more comprehensive data for management than Set 2. I am not at all convinced that the investing public is sophisticated enough to evaluate the presentation of human resources suggested in this questionnaire.

In short, the most frequently mentioned reasons for selecting Set 3 over Set 2 were the ability of Set 3 to provide further information and to improve the comparability feature of the financial statements.

Reasons for Selecting Set 2

simple to comprehend. easier to comprehend.

Keeps the information as clear, brief, and uncomplicated as possible.

More conservative than Set 3, more likely than 3 to become accepted.

Set 2 contains information that is measurable (i.e., cost of training, etc.) whereas Set 3 contains information of expected value of returns on outflow.

of 5 year salaries and wages which, under present economic conditions, is not predictable.

Set 3 seems too blue sky-less precise. But then how precise is any human resource accounting?

In short, the major reasons for selecting Set 2 over the others were (a) the simplicity and the clarity of Set 2 and (b) the conservatism, the measurability, and the precision of the data reported in Set 2.

Reasons for Selecting Neither Set 2 Nor Set 3

I don't think it is possible to properly evaluate human assets in dollar terms on financial statements or balance sheets. Such evaluations are much subjective than can be expressed in dollars and, if any information is supplied, it seems to me that it should be a verbal evaluation of the value of the firm's personnel.

I am unconvinced that monetary value can be applied to human assets. Under either Set 2 or Set 3 Abraham Lincoln, Thomas Edison, the Wright Brothers, and thousand of others would be undervalued and many highly-educated, highly trained, highly paid unimaginative. . . . follow-the-leader types would be overvalued.

Employees are usually a firm's most important asset. However, this is a unique asset which cannot be quantified. To try to do so would lead to inaccuracies and abuses. It would be more harm than good.

I believe either Set 2 or Set 3 would add more confusion to financial statements that are already becoming quite cumbersome and difficult to follow by investors and analysts alike. There comes a point where over-disclosure becomes a disadvantage.

Stockholders are bombarded with information that is over the head of the average investor. The concept of human resources as an asset cannot be measured in

> monetary terms. Hence, the old rule "Recognize your losses at once" and "Recognize your gains when they are realized" is pertinent.
>
> The present trend in accounting toward increasingly complex disclosure requirements by the SEC and accounting profession has already left many users of financial statements drowning in a sea of detailed information they don't understand. In my opinion, this is in part due to the requirements being needlessly complex and in part to insufficient explanation to users of these statements as to what the information means. The latter applies to the proposed human asset statements which in my opinion would merely compound the growing confusion.
>
> Actual cash dollars invested in "People" is not a proper method to evaluate earnings potentials or the condition of a business. Dollars invested in people may or may not have any influence on productivity, good management, employee morale or the quality of the "human assets."
>
> In my opinion these intangible assets distort the true net worth, ratios, and earnings ratios and appear to camuflage the true financial condition of the company. I do not feel that they belong in the statement, but information could and possibly should be given as a foot note.

The above reasons, therefore, can be summarized as follows: (a) impossibility to "dollarized" human resources, (b) inability of the financial statements users to comprehend and utilize monetary measure of human resources, and (c) subjectivity of the monetary information of human resources.

Anticipated Problems and Desired Information Concerning Human Resources

In the last part of the questionnaire, two optional questions were included. In the first question, the participants were asked what additional human resource information they would like to have that was not given in Sets 2 and 3.

The following list includes some of the desired additional information concerning human resources.

> Age, experience, education, and health of senior management.
>
> Average training costs per employee by category.
>
> Average length of employment.
>
> Retraining period adjustments.
>
> Stability and loyalty of employees.
>
> Record of employee turnover, sales per employee, and labor relation and profitability of the enterprise.
>
> Assessment of availability of qualified replacements for key positions.
>
> Anticipated turnover in key positions due to retirement and promotion as well as statistical projection of turnover for all causes in key positions.
>
> Percentage of fixed assets related to development of human assets.

The second question solicited the problems that participants could envision regarding the use of statements Set 2 and/or 3. The following comments were offered:

> If a value on the human resources is too high competitors will start looking at a company's employees with an eye to luring them away.
>
> It would be difficult to evaluate the significance of the dollar amount of Set 2 in light of such variables as employee turnover rates; geographical differences in hiring, etc.
> Set 3 entails unverifiable qualitative assumptions about the future, which is of questionable value.
>
> Set 3 is somewhat more detailed and the present value approach seems somewhat more appropriate than information in Set 2. However, assuming a specific rate of discount is a judgement factor and who indeed selects the appropriate rate and on what basis? Is the 5-year time period a standard for all, various industries, individual companies?

Set 3 includes both information from Set 1 and Set 2 and is thus more informative.
Before either Set 2 or 3 can be of any benefit, the amortization period must be discussed.
Also an understanding of the types of expenditures, discount rates, and ultimate realization of these expenditures would be needed to compare investment alternatives between various companies.

It is difficult enough to measure the tangible assets and liabilities of any company. Inclusion of valuations of items which are part of any ongoing company's operations would distort the ability to accurately measure true worth.

Expectation about the Future Reporting Status of Human Resource Information

In question 14 of the questionnaire, the respondents were asked whether they expect that within the next 5 to 10 years human resource information would be reported by most companies with their conventional financial statements. Of the 209 participants, 108 responded negatively, 72 were undecided, and 29 gave positive answers to that question.

Nonresponse Bias

As stated previously, of the total 452 individuals included in the sample, only 209 responded the questionnaire. This situation, therefore, raises the problem of nonresponse that could possibly imply the following two kinds of bias: (a) that the groups of participants were not representative of those included in the population and (b) that the type of answers was not representative of those that should have been received from the population.[3]

These kinds of bias generally become less significant as a well distributed sample is obtained and as the rate

of responses increases.[4] However, without investigation, no assurance can be maintained that these kinds of bias are absent in a mail questionnaire because not many studies yield a satisfactory and sufficient rate of responses. For instance, according to Mayers and Pratt, "few published results report response rates that exceeds 60 percent; indeed, conclusions are frequently baised on returns from less than 25 percent of the designated responses."[5]

To validate the insignificance of the nonresponse bias, thus, further investigation is needed. Such an investigation can be conducted by obtaining information about some characteristics of a sample of non-respondents and by comparing such information with that of respondents. Several approaches have been suggested for obtaining such information, including personal or telephone interviews with non-respondents.[6]

When these approaches are not applicable and feasible, one of the recommended alternative approaches is to compare "the geographical distribution of the addresses from which a reply was received" "with those from which no return was made. This distribution could be by states, counties, cities, wards, census tracts, or enumeration districts."[7]

In this study, the telephone interviews appeared possible but not feasible for the following reasons:

1. The difficulty of obtaining accurate and useful information due to the inability of insuring that questions are fully understood and the answers are

correctly recorded.

2. The required length of time and the cost involved.[8]

Consequently, the following alternate approaches were adopted for obtaining and comparing information about respondents and non-respondents in each four groups of professions used in this study:

For the groups of CPAs and CFAs, the state of residence of the respondents and the non-respondents were used. This information was preferred because it could be furnished with a reasonable amount of effort and cost.

For the group of controllers, the number of individuals employed by their firms was used. This information was gathered from the May 1975 issue of Fortune magazine that reported the number of employees of 500 largest corporations in the United States. Such information was deemed to be closely related to the human resource topic on the assumption that employees are valuable resources of firms. Thus, if all non-respondents in the controller group came from companies with high numbers of employees, the conclusion could be drawn that controllers of these companies may not have interest in human resource accounting and thus the results of the study are subject to some nonresponse bias.

For the group of trust and financial officers, the total capital of their companies was used. This information was expected to imply tacitly (a) the level of education, the aggressiveness, and the ability of officers and (b) the value of the companies' human resources. In other words,

as the capital of a company increases, the level of the education and the ability of its employees should increase and, in turn, should result in a higher value of its human resources.

Tables 5-40, 5-41, 5-42, and 5-43 present the comparative information used for the analyses of nonresponse bias. Tables 5-40 and 5-41 show the frequency distributions for CPAs and CFAs respondents and nonrespondents on the bias of the state of residence. As can be seen, the respondents are well distributed and, except in a few cases, the ratios between respondents and nonrespondents in different states are quite reasonable.

Table 5-42 gives the frequency distribution for trust and financial officers of banks and trust companies on the basis of the companies' capital. With few exceptions, this table also indicates an appropriate distribution of the sample and reasonable proportions between respondents and nonrespondents.

Table 5-43, likewise, demonstrates the frequency distribution for controllers on the basis of the number of their company's employees. To facilitate the grouping of the companies according to the number of their employees, Fortune magazine ranks were used. The rank No. 1, for instance, indicates that the company has the highest number of employees among the 500 largest companies in the United States. This table also indicates that the respondents were well

TABLE 5-40

CLASSIFICATION OF RESPONDING AND NON-RESPONDING CPAs ON THE BASIS OF THE STATE OF RESIDENCE

States	No. of Respondents	No. Non-Respondents	Total
Alabama	1	1	2
Arizona	1	2	3
Arkansas	1	0	1
California	2	5	7
Colorado	1	0	1
Connecticut	2	2	4
Florida	0	3	3
Georgia	1	1	2
Maryland	0	1	1
Illinois	3	3	6
Iowa	1	0	1
Louisiana	0	1	1
Massachusetts	1	3	4
Michigan	1	0	1
Minnesota	1	1	2
Mississippi	1	1	2
Missouri	4	1	5
Montana	1	0	1
Nebraska	1	0	1
New Jersey	2	1	3
New Mexico	0	1	1
New York	2	9	11
North Carolina	1	0	1
Ohio	3	3	6
Oregon	1	1	2
Texas	4	5	9
Pennsylvania	3	7	10

TABLE 5-40 (Continued)

States	No. of Respondents	No. Non-Respondents	Total
South Carolina	1	0	1
Virginia	3	0	3
Washington	3	1	4
Wisconsin	1	0	1
Total	47	53	100

*See Appendix C for more information.

TABLE 5-41

CLASSIFICATION OF RESPONDING AND NON-RESPONDING CFAs ON THE BASIS OF THE STATE OF RESIDENCE

States	No. of Respondents	No. of Non-Respondents	Total
Arizona	0	2	2
California	5	4	9
Colorado	2	0	2
Connecticut	0	1	1
Delaware	1	0	1
Florida	1	0	1
Georgia	0	1	1
Illinois	1	4	5
Iowa	1	2	3
Kansas	2	0	2
Louisiana	2	0	2
Massachusetts	2	3	5
Michigan	0	1	1
Minnesota	2	0	2
Mississippi	1	0	1
Nebraska	3	0	3
New York	10	19	29
North Carolina	2	3	5
Ohio	4	2	6
Oklahoma	2	0	2
Oregon	1	0	1
Pennsylvania	3	1	4
Rhode Island	1	0	1
Texas	1	0	1
Virginia	1	1	2
Washington	3	2	5
Wisconsin	1	2	3
Total	52	48	100

TABLE 5-42

CLASSIFICATION OF RESPONDING AND NON-RESPONDING CONTROLLERS ON THE BASIS OF THEIR COMPANIES' NUMBER OF EMPLOYEES

Rank for No. of Employees Used By Fortune Magazine	No. of Respondents	No. of Non-Respondents	Total
1 to 50	5	7	12
51 to 100	5	3	8
101 to 150	5	5	10
151 to 200	2	8	10
201 to 250	5	3	8
251 to 300	5	3	8
301 to 350	4	8	12
351 to 400	6	3	9
401 to 450	6	5	11
451 to 500	3	2	5
Not Available	2	5	7
	48	52	100

TABLE 5-43

CLASSIFICATION OF RESPONDING AND NON-RESPONDING TRUST OFFICERS ON THE BASIS OF THE COMPANIES' AMOUNT OF CAPITAL

Amount of Capital	No. of Respondents	No. of Non-Respondents	Total
$0- $500,000	10	19	29
$500,001- $750,000	4	9	13
$750,001- $1,000,000	4	4	8
$1,000,001- $2,500,000	5	9	14
$2,500,001- $5.000,000	5	6	11
$5,000,001- $7,500,000	0	3	3
$7,500,001-$10,000,000	0	1	1
$10,000,001-$15,000,000	2	1	3
$15,000,001-$20,000,000	1	3	4
$20,000,000-$50,000,000	3	0	3
$50,000,000-Over	2	1	3
Not Available	4	4	8
	40	60	100

distributed and that the proportions between respondents and nonrespondents in most cases were reasonable.

In short, although a firm conclusion cannot be reached concerning the absence of nonresponse bias, the above tables indicate a relative non-bias of the sample and the outcomes of the study.

FOOTNOTES

[1]Janet T. Spence, Benton J. Underwood, Carl P. Duncan, and John W. Cotton, Elementary Statistics (New York: Meredith Co., 1968), p. 216.

[2]Ibid., p. 217

[3]Walter B. Wentz, Marketing Research: Management and Methods (New York: Harper & Row Publishing Company, 1972), p. 88.

[4]Norman Gaither, "The Adoption of Operations Research Techniques by Manufacturing Organizations: A Regional Examination and Analysis," unpublished dissertation, the University of Oklahoma, 1974, p. 82.

[5]Charles S. Mayer and Robert W. Pratt, Jr., "A Note on Nonresponse in a Mail Survey," Public Opinion Quarterly, Vol. 30 (1966-67), p. 637.

[6]Wentz, Marketing Research: Management and Methods, p. 158.

[7]Mildred Parten, Surveys, Polls, and Samples; Practical Procedures (New York: Harper & Brothers, Publishers, 1950), p. 401.

[8]Wentz, Marketing Research: Management and Methods, p. 159.

CHAPTER VI

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

In this chapter a brief summary of the objectives, research methodology, and findings of this study are presented. In addition, the conclusions and recommendations concerning human resource accounting are included.

Summary

During the past decade much has been said about the utility of human resource accounting. A few empirical studies also have been conducted regarding the utility and the applicability of human resource accounting. However, several important issues still require further investigation, including the following that were suggested by some of the members of the American Accounting Association's 1972-73 committee on Human Resource Accounting:

1-The development of measurement methods

2-The question of utility of human resource accounting to the users of accounting information

3-The appropriateness and method of reporting human assets to external users of corporate financial accounting information.

4-The development of potential operational system in organization, and

5-The organizational impact of human resource accounting information.[5]

This study was designed to investigate and hopefully provide some answers to three of the above issues. The first attempt, therefore, was directed to the development of a new measurement model. For this purpose seven of the presently available measurement models for human resources were critically reviewed and analyzed. As a result, a new measurement model was devised which contains fewer shortcomings than the presently available models. For instance, the proposed model appears to be more comprehensive for utilizing not only the unexpired costs of investments in employees' recruiting, training, and developing, but also an estimated "implicit purchasing price of employees' potential services." Furthermore, the proposed model also uses a discount rate and a productivity factor of employees, which are determined through a set of equations with less opportunity of interjection of personal bias.

In addition to the development of a new measurement model, this study was set forth to investigate empirically the following research questions.

1. Is the human resource information provided on the basis of the acquisition cost model useful for making investment decisions by the users of financial statements?

2. Is the human resource information provided on the basis of the proposed measurement model useful for making investment decisions by the users of financial statements?

3. Which of the two measurement models is preferred by the users of financial statements?

4. Which of the three suggested methods of reporting human resource information is preferred by the users of financial statements?

5. Will the responses to the first two research questions differ significantly on the basis of the profession, the educational background, and the level of the respondents' reliance on the conventional financial statements?

To provide answers to the research questions, a random sample was used from 100 CPAs, 100 CFAs, 121 managers and controllers, 100 trust and financial officers of bank and trust companies, and 31 graduate students from the University of Oklahoma.

This sample was expected to represent a segment of the population in the United States which prepares and/or uses published financial statements for investment decision making. The individuals in the sample were sent a copy of the questionnaire that accommodated three sets of financial statements prepared on the following assumptions and principles. (Copy of the questionnaire and the accompanying letters are in the appendix A.)

> Set #1: This set of the financial statements was prepared on the basis of conventional accounting principles. Therefore, all the cash outlays related to recruiting, training, and developing employees were viewed as current expenses and were treated accordingly.
>
> Set #2: This set of the financial statements was prepared on the basis of the acquisition cost model. Therefore, that part of the recruiting, training, and developing costs of employees which expected to benefit future operating periods was first capitalized, then gradually amortized according to the "matching principle."

Set #3: This set of the financial statements was prepared on the basis of the proposed model. Thus, it included the discount value of adjusted 5-year salaries, wages, and fringe benefits of all employees, in addition to the capitalized costs of recruiting, training, and developing employees.

To eliminate any personal bias, opinion, and artificiality in making up these three sets of financial statements, information revealed on the financial and human asset statements of R. G. Barry Corporation for 1971 was used.

Of 452 individuals to whom a copy of the questionnaire was sent, 209 (46.2%) participated in the study. These participants consisted of 41 CPAs, 34 CFAs, 47 trust and financial officers, 56 managers and controllers, and 31 students. These figures, therefore, represented a rate of response equal to 43.9% for non-student participants, after excluding 16 not completed questionnaires.

The responses of the participants were, then, analyzed by utilizing a computer soft ware package, Biomedical Computer Program (BMD) and statistical tools such as percentages, frequency distributions, ranks, means, standard deviations, analysis of variance, F ratio test, Chi-square test, contingency coefficient, and nonparametric Wilcoxon Signed-Ranks test.

Conclusions

The findings and conclusions concerning the research questions are as follow:

Research Question One

Concerning this research question, 34.9 percent of the total 209 participants reported that the human resource information prepared on the basis of the acquisition cost model and reported in Set 2 was not helpful for making investment decisions; 27.8 percent, little helpful; 28.2 percent, somewhat helpful; 7.2 percent, helpful; and 1.9 percent, very helpful.

Based on the statistical analysis of these data a conclusion can be drawn that human resource information was helpful for making investment decisions. However, the amount of help expected to be provided by the information was slightly higher than the scale of "little" in the applied 5-point ordinal scale. In addition, the degree of usefulness of such information varied according to the profession of the users. The ranking indicated that managers perceived the lowest utility for such human resource information and that CPAs, CFAs, trust officers, and students perceived a higher utility.

Research Question Two

Regarding this research question, 41.1 percent of the total 209 participants reported that the human resource information prepared on the basis of the proposed model and reported in Set 3 was not helpful for making investment decisions; 28.2 percent, little helpful; 19.1 percent, somewhat helpful; 8.1 percent, helpful; and 3.3 percent,

very helpful.

A similar conclusion to that of research question one can be drawn for this research question. In this case, also, managers perceived the lowest utility for the information and CPAs, CFAs, trust officers, and students perceived a higher utility.

Research Question Three

Concerning this research question, 46.4 percent of the total 209 participants reported that the human resource information prepared on the basis of the proposed model was not helpful more than that prepared on the basis of the acquisition model for making investment decisions; 27.8 percent, little more helpful; 15.3 percent, somewhat more helpful; 8.6 percent, much more helpful; and 1.9 percent, more helpful to the extent of very much. Also, 28.9 percent of the total participants preferred Set 3; 30.6 percent, Set 2; and 40.7 percent, neither of the two sets. The main reasons given by those who preferred Set 3 were the completeness and comprehensiveness of Set 3. The reasons given by those who preferred Set 2 were the simplicity and clarity of Set 2. Those who did not prefer either sets believed that (a) it is impossible to put dollar value on human resources, (b) the users of financial statements already have excessive amount of information that they cannot utilize, and (c) the subjectivity of such human resource information.

Based on the statistical analysis of the data, the difference between the usefulness of the proposed model and the acquisition cost model was not statistically significant.

Research Question Four

Concerning this research question, 7.7 percent of the total participants suggested that human resource information prepared on the basis of either of the two models be reported as part of the conventional financial statements; 22.5 percent, as footnotes to the conventional financial statements; 35.9 percent, in separate supplementary financial statement; and 34.0 percent, not to be reported at all. Therefore, reporting monetary information about a firm's human resources through a supplementary set of statements appears to be more preferable.

Research Question Five

The statistical tests indicated some degree of relationship between different professional groups and the perceived usefulness of human resource information provided according to either of the two measurement models. This relationship was statistically significant at the 5 percent level of significance for both models. Further statistical tests also showed a significant difference of opinion between managers and trust officers concerning the usefulness of Sets 2 and 3. This difference of opinion

appeared to be also notable between CPAs and trust officers. In contrast, the difference of opinion did not appear to be significant between (a) CPAs and CFAs and (b) CFAs and managers. Based on these observations, therefore, the conclusion can be drawn that trust officers and students had more favorable view toward the usefulness of Sets 2 and 3 than managers, CPAs, and CFAs.

The findings of this study showed no significant relationship between the level of education of the participants and the perceived usefulness of human resource information given either in Set 2 or 3. However, some degree of association was found between the recency of the education and the usefulness of Sets 2 and 3. This finding indicates that those who had completed their education recently viewed human resource information given in Sets 2 and 3 more useful than others.

No significant relationship was detected for all participants between their level of familiarity with human resource accounting and the usefulness of Sets 2 and 3. Nonetheless, a set of pair comparison Chi-square tests indicated that familiarity with human resource accounting in certain level caused some of the participants to view Sets 2 and 3 differently from others.

The relationship between the usefulness of Sets 2 and 3, on the one hand, and the level of the participant's job in advising investors how to manage their investments,

on the other hand, appeared to be statistically significant when a Chi-square test was run for all 209 participants collectively. Such an association did not appear to be significant when students were excluded from the Chi-square calculation.

The association between the perceived usefulness of Sets 2 and 3 and the degree of reliance of the participants upon the published financial statements was not statistically strong. This finding indicated that the degree of usefulness of the information in Sets 2 and 3 was the same to all users of financial statements, regardless of how much the users relied upon and used published financial statements for making investment decisions.

Recommendations

The findings of this study indicate that many users of financial statements were not sufficiently familiar with human resource accounting. Therefore, a need is indicated for the users of the financial statements to be more exposed to and familiar with the potentials and the shortcomings of human resource accounting and the different methods of measurements. One way of meeting this need is to demonstrate and contrast the possible decision outcomes after utilizing financial statements (a) with and (b) without monetary information about a firm's human resources. Such presentations will be, indeed, more convincing and effective if based on the actual experience

data of firms that utilize human resource accounting.

This study, furthermore, reveals that, while many of the participants did not express strong preference for receiving monetary information about a firm's human resources for making investment decisions, some showed great interest in receiving and utilizing the following non-monetary information:

1. Age, experience, education, and health of serior management.
2. Average length of employment.
3. Retraining period adjustments.
4. Stability and loyalty of employees.
5. Record of employee turnover, sales per employee, and labor relationship.
6. Assessment of availability of qualified replacements for key positions.
7. Anticipated turnover in key positions due to retirement, and promotion, as well as statistical projection of turnover for all causes in key positions.
8. Percentage of fixed assets related to development of human resources.

These types of information, if available to the reporting entity, therefore, should be provided to the users of financial statements to assist them with their investment decisions.

With regard to the monetary measures of a firm's

human resources, this study reveals that majority of the statement users did not prefer to receive such information as an integrated part of the conventional financial statements. Consequently, the recommendation is made that such information be given in a separate, supplementary financial statement. This recommendation is based on the consensus of the participants in this study who considered monetary measures of human resources useful in investment decision making.

This study also highlights the following problematic areas regarding the monetary measures examined in this study:

1. The type of the human resource expenditures (i.e., recruiting, training, familiarizing, developing, etc.) that should be capitalized.
2. The time span over which the capitalized cost of human resources should be amortized.
3. The number of years that employees' compensation should be discounted.

Investigation concerning the development of a set of general rules about the foregoing three problems, therefore, appears necessary and is recommended so that human resource accounting can achieve higher utility and acceptability.

On the basis of findings of this investigation, further empirical study is recommended concerning the following issues:

1. Are monetary measures and models used in this study

useful to other users of financial statement, especially management?

2. How closely do the acquisition costs of a firm's human resources (i.e., recruiting, training, familiarizing, developing, etc.) correlate with the success of the firm?
3. How closely does the employees' compensation of a firm correlate with the success of the firm?

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APPENDICES

The University of Oklahoma 307 West Brooks, Room 200 Norman, Oklahoma 73069

Division of Accounting
College of Business Administration

APPENDIX A

FINANCIAL STATEMENT INFORMATION?
AN EMPIRICAL RESEARCH QUESTIONNAIRE

There is unanimous agreement that the purpose of financial statements is to provide useful information. Do they? Who determines what is useful? We believe it is you, the practicing professional. We can avoid the trap of ivory tower thinking only through cooperation of professionals such as you. Mr. Mohammad Sangeladji, a doctoral candidate at the University of Oklahoma, and I, are conducting this study which is aimed at examining some aspects of the usefulness of financial statement information. We are confident that the results of this study will contribute, in the long run, to improving the quality of information received. Your response will contribute to the success of this study and to the completion of Mr. Sangeladji's doctoral studies.

Testing indicates that this two page questionnaire will take approximately 10 to 20 minutes to complete. Since your opinions are essential, I hope you will complete and return this questionnaire at your earliest convenience. You will remain, if you wish, anonymous in this study. Only group responses will be reported. We are using a code number only to facilitate follow-up; however, if you wish a summary of the results of the study please fill in your name and appropriate address in the place indicated on the form.

Some of you might find that your colleagues are also filling out the same questionnaire. Please do not discuss its contents with them. The validity of the results depends upon independent responses. Thank you for your cooperation.

Sincerely,

William C McGrew

William C. McGrew, Ph.D., C.P.A.
Professor of Accounting

For a number of years there have been serious questions raised as to usability of currently published financial statements. Part of this criticism has concerned the fact that only tangible assets have been included in the financial statements, with no thought given to the inclusion of human assets, the men and women in the company that make it run. I am conducting a study to measure the potential effectiveness of including human assets on the financial statements. I would very much appreciate your assistance in helping to determine whether measuring and reporting human assets would be useful in making investment decisions. The attached questionnaire has three sets of financial statements, prepared on the following bases.

STATEMENTS SET 1: This set of financial statements is prepared on the basis of conventional accounting principles. Therefore, all the cash outlays related to recruiting, training, and developing employees were viewed as current expenses and were treated accordingly.

STATEMENTS SET 2: This set of financial statements is prepared on the assumption that part of currently incurred costs of recruiting, training, and developing employees could benefit future operating periods. Thus, such outlay costs were first capitalized, then gradually amortized according to the "matching principle." In short, costs of recruiting, training, and developing employees appear on Set 2 as a monetary measure of the company's human assets.

STATEMENTS SET 3: This set of financial statements is prepared on the assumption that employees' compensation is a reliable and readily available index, representing a major part of the value and costs of a firm's human assets. In other words, the higher the contribution of employees to the firm, the higher would be their compensation. Based on this assumption, Set 3 includes the discount value of adjusted 5-year salaries, wages, and fringe benefits of all employees, in addition to the capitalized costs of recruiting, training, and developing employees, as a monetary measure of the company's human assets. The discount rate and the adjustment factor, as used in Set 3, were based on the company's current earnings.

NOTE: If you wish a summary of the results, please complete the following section.

Your name: _____

Your title: _____

Your address: _____

_____

Sincerely yours,

M.A. Sangeladji

M.A. Sangeladji

QUESTIONNAIRE

As a potential investor you receive the following three sets of financial statements for ABC Company.

CONDENSED BALANCE SHEET

	CONVENTIONAL	HUMAN ASSET	
	SET 1	SET 2	SET 3
Tangible Assets	$ 17,652,370	$ 17,652,370	$ 17,652,370
Human Assets:			
Capitalized hiring, training, and developing costs	NR	1,561,000*	1,561,000*
Discount value of 5-year adjusted compensation	NR	NR	53,647,500**
Total Resources	17,652,370	19,213,370	72,860,870
Liabilities & owners' equity (not related to human assets)	17,652,370	17,652,370	17,652,370
Liabilities related to human assets	NR	780,500	53,457,000
Retained earnings related to human assets:			
Related to capitalized cost of hiring, training, and developing	NR	780,500	780,500
Related to discount value of adjusted compensation	NR	NR	971,000***
Total Liabilities & Owners' Equity	17,652,370	19,213,370	72,860,870

CONDENSED INCOME STATEMENT

	CONVENTIONAL	HUMAN ASSET	
Net Sales	$ 34,123,000	$ 34,123,000	$ 34,123,000
Total Expenses	31,720,000	31,720,000	31,720,000
Income before taxes	2,403,000	2,403,000	2,403,000
Net increase in human assets (capitalized cost of training, etc.)	NR	137,800****	137,800****
Adjusted income for human assets	2,403,000	2,540,800	2,540,800
Income Taxes	1,129,000	1,197,800	1,197,800
Net Income	1,274,000	1,343,000	1,343,000

NR = Not reported.
* = Unamortized costs of hiring, training, and developing employees which are expected to benefit future operating periods.
** = Discount value of adjusted 5-year salaries, wages, and fringe benefits of all employees. The discount rate and adjustment factor are determined on the basis of current earnings of the company.
*** = Discount value of expected returns on outflow of 5-year salaries, wages, and fringe benefits (Net Present Value of employees' contributions in the coming five years).
**** = Part of the last year's investments in recruiting, training, and developing employees which were expensed in Set 1 could have been capitalized. When capitalized as in Sets 2 and 3, these costs would reduce the period expenses and increase the period income.

QUESTIONS:

1-If you were considering an investment in the stocks of the ABC Company, how much would the information divulged in Set 2, in addition to that given in Set 1, help you to make a better investment decision?

☐ very much ☐ much ☐ some ☐ little ☐ none

2-If you were considering an investment in the stocks of the ABC Company, how much would the information divulged in Set 3, in addition to that given in Set 1, help you to make a better investment decision?

☐ very much ☐ much ☐ some ☐ little ☐ none

3-If you were considering an investment in the stocks of the ABC Company, how much would the information divulged in Set 3, in addition to that given in Set 2, help you to make a better investment decision?

☐ very much ☐ much ☐ some ☐ little ☐ none

4-As a user of financial statements, how would you prefer that information about human assets divulged in Set 2 or Set 3 be reported?

☐ Reported as part of the conventional financial statements.
☐ Reported as footnotes to the conventional financial statements.
☐ Reported as a separate supplementary financial statement.
☐ Not to be reported at all.

5-Between Set 2 and Set 3, which one would you prefer to have as supplementary information to the conventional financial statements?

☐ Set 2 ☐ Set 3 ☐ Neither

6-Please state very briefly the reason(s) for your selection in question 5. (Please use the back of this form for additional space.)

7-Before receiving this questionnaire, how familiar were you with the human asset accounting?

☐ quite familiar ☐ familiar ☐ somewhat familiar ☐ little familiar
☐ not familiar

8-You are:

☐ a CPA working at a CPA firm (or other firm)
☐ a CFA working at an investment firm
☐ a trust or financial officer working at a bank or trust company
☐ a controller or financial officer of a company
☐ a student at the University of Oklahoma

9-What is the highest level of education you completed?

☐ some high school
☐ high school graduate
☐ some college
☐ college graduate

10-When was that level of education completed? 19___

11-What degree do you hold, if a college graduate?

☐ Bachelor
☐ Master
☐ Ph.D.

12-Is consulting or advising investors, companies, or institutions on how to manage their investments

☐ the main part of your job?
☐ a considerable part of your job?
☐ encountered frequently in your job?
☐ encountered only occasionally in your job?
☐ hardly encountered in your job?

13-For making investment decisions in a company, how much do you rely upon and use information divulged in the published financial statements?

☐ very much ☐ much ☐ some ☐ little ☐ none

14-Within the next 5 to 10 years, do you expect information about human assets to be reported with the published financial statements by most companies?

☐ definitely yes ☐ yes ☐ not sure ☐ no ☐ definitely no

15-Your age is _____.

OPTIONAL QUESTIONS: With respect to the use of human asset information in making an investment decision:

a) what additional information would you like that is not presented in either statement Set 2 or 3?
b) what kinds of problems do you envision with respect to the use of statement Set 2 and/or Set 3. (You may use the back of this questionnaire for your comments, if additional space is needed.)

The University of Oklahoma 307 West Brooks, Room 200 Norman, Oklahoma 73069

Division of Accounting
College of Business Administration

February 28, 1975

Dear Sir:

Recently I requested your participation in an important study concerned with my doctoral dissertation. Your response is urgently needed. In addition, your completing the questionnaire will help me in fulfilling the requirements for a doctoral degree at the University of Oklahoma.

If you have already returned the questionnaire, please consider this note a "thank you" for your valuable help.

If you have not had a chance to do so as yet, would you return the completed form now in the enclosed stamped envelope? I am trying to get as near a "perfect survey" as possible. This goal means getting a reply from everyone who received a questionnaire. Your opinions about the various items in the questionnaire will lead to a better understanding of the needs and usefulness of human resource accounting.

Your participation is vital to the success of my study. Testing indicates that this short questionnaire will not take more than several minutes to complete. I shall be most grateful for your participation and an immediate response.

Sincerely yours,

M. A. Sangeladji
Special Instructor in Accounting
and a Ph. D. Candidate

Enclosure

MAS/cn

APPENDIX B

ESTIMATING THE "IMPLICIT PURCHASING PRICE" (C_{hi})

Information needed for such an estimation includes:

C_p = Cost of physical and intangible assets, excluding human resources; for the case on hand this cost is $17,654,223.

C_{he} = Unexpired explicit acquisition cost of human resources, i.e., recruiting, training, and developing employees; $1,561,264.

I = Annual income adjusted for the investments in human resources; $1,343,003.

C_i = Annual compensation of employees.

NOTE: Specific information about R. G. Barry Corporation was not available to the investigator. For the sake of calculation, it is assumed to be $11,125,000.

To make the model operational, an assumption should be made about the span of time during which the potential services of the present employees materialize; that is the number of years that employees' annual compensation should be used for the computation purposes. To simplify the calculation, only five years of employees' compensation, based on their compensation in the year of computation, is used below. The 5-year criterion, in fact, cannot be justified scientifically. However, application of such a criterion will not curtail significantly the usefulness and comparability of the measurement if all firms use this measurement model and the criterion.

$$a \cdot (C_p + C_{he} + C_{hi}) = I$$

$$C_{hi} = \frac{C_1(1+a)}{(1+a)^1} + \frac{C_2(1+a)}{(1+a)^2} + \frac{C_3(1+a)}{(1+a)^3} + \frac{C_4(1+a)}{(1+a)^4} + \frac{C_5(1+a)}{(1+a)^5}$$

Where: a = Aggregate rate of return

C_{hi} = Estimated implicit purchasing price of employees' 5-year services; or discount value of 5-year adjusted compensation.

$$a(17,654,223 + 1,561,264 + C_{hi}) = 1,343,003$$

$$C_{hi} = \frac{11,125,000(1+a)}{(1+a)^1} + \frac{11,125,000(1+a)}{(1+a)^2} + \ldots + \frac{11,125,000(1+a)}{(1+a)^5}$$

If the foregoing two equations are solved simultaneously, the following figures will result.

$$a = 1.8431\%$$

$$C_{hi} = \$53,647,760$$

Liability Related to Discounted Compensation:

$$L_{hi} = \frac{11,125,000}{(1+a)^1} + \frac{11,125,000}{(1+a)^2} + \ldots + \frac{11,125,000}{(1+a)^5}$$

$$L_{hi} = \$52,676,875$$

Owners' Equity Related to Discounted Compensation:

$$E_{hi} = C_{hi} - L_{hi} = 53,647.760 - 52,676,875 = \$970,885$$

APPENDIX C

The columns in the following table correspond with Tables 5-40, 5-41, 5-42, and 5-43. For instance, column one indicates that of 100 CPAs who were sent the questionnaire, 47 participated in the study. However, four of these 47 CPAs considered themselves as controllers and one as trust officers and thus marked the questionnaire accordingly. On the other hand, three of the participating controllers considered themselves as CPAs and marked the related answer in the questionnaire. These occupational interchanges caused the number of participating CPAs to be reported as 45 in column 3, Table 4-1. The other columns of the following table are related to other professional groups.

OCCUPATIONAL INTERCHANGES

CPAs	CFAs	Trust Officers	Con-trollers
47	52	40	48
(5)	0	1	4
0	(12)	10	2
0	1	(3)	2
3	0	1	(4)
45	41	49	52